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Fighting Inflation

THE Budget introduced last Tuesday by Mr. D. Heathcoat Amory, Chancellor of the Exchequer, is satisfactory in so far as advantage has been taken of opportunities to fight inflation. The reason why the Chancellor has not gone further in taking measures to relieve the burden of taxation, to encourage investment, or otherwise to allow some relaxation is the constant and pressing need to buttress sterling and check inflation and its resultant untoward consequences. The increase of the initial tax allowance on capital expenditure by one-quarter, to 25 per cent on plant and machinery and 12½ per cent on industrial buildings, is a useful step. It will encourage capital investment at a time when planning has become perhaps unduly cautious. In the circumstances, it does not seem that he could have granted greater relief. In the amalgamation of the two rates of profits tax he has rectified an anomalous situation, and ensured a fairer incidence of tax among firms irrespective of their methods of finance. Other steps taken to encourage investment are the confirmation to the Capital Issues Committee and the

banks that the Government does not desire investment to be restricted by lack of credit finance in districts where unemployment is above the average; and the proposed Bill to enable the Treasury to give financial assistance to concerns in these districts when this is deemed to serve to reduce unemployment. There is no mention of measures to increase the speed of implementation in the railway modernisation plan; in view of the vital importance of the railways to the national economy, it might perhaps have been thought that there was a case for this. The need for strict financial economy, especially where the amounts concerned are necessarily large, presumably was considered paramount. For the same reason there is no remission of the fuel oil duties, which would have eased the position of public transport undertakings and gone far to afford at least a temporary solution of the problems of busmen's wages. The reconstruction of the purchase tax does not seem likely to make very much difference in spending on consumer goods. The Budget is necessarily, and rightly, negative in its measures to arrest inflation. It is bound to disappoint many, but in most ways is the best possible in a situation demanding caution and firmness.

Exports to New Zealand

IT is not thought that the present sterling exchange difficulties and import restrictions in New Zealand will curtail in any way the importation from the United Kingdom of rolling stock and railway material required for major works. These imports are expected to be given preferential treatment, as will also plant for the expansion of hydro-electric works. Since the change of Government in November, the Railways Department has not announced any major purchases overseas, but there are substantial contracts already let that have yet to be completed. The biggest project envisaged at present seems to be the installation of C.T.C. on several sections. Whether electrification of the Auckland suburban lines will be embarked on in the near future is problematical; even more so is that of the North Island main line between the Wellington (already electrified) and Auckland suburban areas, though it looks less remote now than two or three years ago. Meanwhile, the placing in service of diesel locomotives is increasing efficiency by reducing running times and augmenting line capacity over several sections.

Visit of Chinese Technical Mission

IT is gratifying that four members of the Chinese technical mission which was recently in France to study the French National Railways, have been able to accept a joint invitation from the British Transport Commission and the Locomotive & Allied Manufacturers' Association to visit the United Kingdom. All four are engineers with the Chinese Ministry of Railways. Whilst their visit is too short for them to see more than a fraction of what the British locomotive and railway equipment manufacturers have to offer, they have indicated from the outset that they would like to concentrate on a.c. electrification; their congested itinerary has been planned accordingly. These welcome visitors will, in their brief stay, become aware from their discussions with the Commission and from their visits to British Railways and the works of various electric locomotive and traction equipment manufacturers that this country is well able to supply the requirements of the Chinese railways for a.c. electric locomotives and, indeed, locomotives and railway equipment generally. The British locomotive industry has a long-standing tradition of supplying the Chinese railways. It is much to be hoped that this visit precedes renewal of this supply relationship between the United Kingdom and China.

C.I.M.A.C., 1959

FOLLOWING a recent meeting of the Permanent Committee of the Congress on Combustion Engines (C.I.M.A.C.) in Barcelona, a decision has been taken to hold the 1959 meeting in Wiesbaden from June 15 to

June 20 inclusive. As stated in our November 29, 1957, issue, the subject of the Congress will be "Diesel engines and gas turbines up to 1,500 h.p.—Current problems concerning design, production, development and running at site." It is expected that some 40 papers will be discussed as opposed to 30 at the Zürich Congress held last year, an indication of the interest shown in the forthcoming meeting. A total of 64 synopses was received from eight participating countries, of which 31 were accepted and 17 referred back to authors with queries. The United Kingdom submitted the largest number of synopses and received the highest number of acceptances. Finished papers will be considered by the Permanent Committee in the autumn. A system of simultaneous translations will be available in three languages—English, French, and German. In some cases there may be arrangements for parallel sessions. An agreed programme for the Congress is likely to be announced by the Permanent Committee in December next. The British National Committee will then be in a position to give details and receive applications from those in the United Kingdom who wish to attend the Congress.

Further Southern Region Electrification

THE third rail system at 660 V. d.c. has been adopted for the Gillingham to Ramsgate and Dover lines of the Southern Region, now in process of conversion, and for the planned extension of electrification from Sevenoaks via Ashford to Dover and Ramsgate, and on certain connecting lines in Kent, Surrey, and Sussex. This is only natural, as much of the mileage nearer the London termini is already on this system, and the mileage being, or to be, electrified is not great in proportion. The situation is different in the case of conversion of the former L.S.W.R. main lines west of Sturt Lane Junction, 32 miles from Waterloo, to Southampton and Bournemouth and possibly beyond on the Weymouth line, and also to Salisbury and Exeter, as is envisaged during the next 15 years. It is hard at present to see how traffic could justify electrification of the West of England line between Salisbury and Exeter; one would have thought that the diesel traction proposed as an interim stage would suffice.

Dual-Voltage Electric Locomotives

IN a few years the economics of diesel and electric traction may be entirely changed; one factor may well be the availability of cheaper electric power from atomic generating stations, with a relative scarcity of coal in districts remote from coalfields. In that event, electrification to the west of Salisbury might be the cheapest solution, when associated with that of the Bournemouth line. As 50-cycle traction has been adopted for other Regions of British Railways, it seems to be by far the best system for the Southern Region lines beyond Sturt Lane (or Basingstoke, say, or some other point not too far from London)—apart from the complication of running over the third-rail system in and out of Waterloo. A good deal of research is being conducted into dual-voltage techniques. It may be that an answer will be found to the Southern Region problem in the form of a traction unit for service on both third rail and 50-cycle overhead electric lines.

S.A.R. Air-Conditioned Stock

DELIVERY, towards the end of this year, of the nine air-conditioned dining cars ordered by the South African Railways from Wegmann & Company will allow the extension of air-conditioned facilities to a number of long-distance main-line trains. At present the "Blue Train" sets, built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., are the only air-conditioned stock operating in the Union. Two of the new air-conditioned coaches, which are similar to those of the "Blue Train," will replace those now used on that service, and two are to be allocated to the "Orange Express" running between Cape Town and Durban. The remaining five will be used

on ordinary long-distance main-line trains. Air-conditioning equipment for these vehicles is being supplied by J. Stone & Co. (Deptford) Ltd.

A Word to be Banned

FOR many months "The Man on the Line" has been trying, and we believe with some success, in his stimulating editorials in *British Railways Magazine* to instil some sound ideas in his readers. In the April issue he advocates the banning of "concession" from the railway commercial vocabulary. Of a new freight service or passenger fare reduction he states: "Call it a bargain, or say that the service is cheaper, better, easier, simpler—but, for goodness sake, not a concession!" The word dates back to the days of the railways' near-monopoly and is associated with remoteness and inflexibility. For that reason it should be dropped forthwith. Unfortunately the attitude of mind with which it is associated persists in a few railwaymen who deal with traders and the travelling public. The art of salesmanship is hard to practise in dealing, for instance, with fixed-price articles such as passenger tickets, and with a customer, one of a queue, on the other side of a booking window. Nevertheless it must be practised—even although it may be possible only to show patience and courtesy. We have heard skilful, quick salesmanship of excursion tickets at a London terminus booking window on a summer Sunday morning. With goods rates the task is perhaps a trifle easier.

Serving Gatwick Airport

A MAJOR feature of the new Southern Region station at Gatwick Airport, construction of which is described elsewhere in this issue, is the provision of a new half-hourly train service based on a reversible line in the station converted from the existing up local line. Major track and signalling alterations will allow the down service from Victoria to Bognor Regis to run from the down local into the reversible line, detach a portion of the 12-car train to be picked up again by the next Bognor Regis up train. In association with the running of these 12-car trains, platforms are being lengthened at Purley, Coulsdon South, Merstham, and Redhill where, at present, only eight-car trains can be accommodated. Track and signalling alterations between Gloucester Road Junction and South Croydon to convert the down relief line between Windmill Bridge Junction and South Croydon into a reversible line are also in hand. This reversible working, although not the first of its kind in the Southern Region, is a major development, and will allow more efficient operation of the new services.

Power Signalling at Naples

A SHORT general account is given on another page of the power signalling at the rebuilt Naples Central Station. That terminus has been arranged with 25 platform lines, with a connection from the low-level Piazza Garibaldi station, through the Gianturco station with the main routes beyond. The working of the latter, except for purely local movements, is now controlled from the new signalbox. This is of the relay interlocking type, with route setting from push-buttons on a system selected after consideration of the various arrangements used in this class of work. Separation between buttons and diagram has been preferred to combining them. Running movements are directed from their own console, leaving shunting and emergency individual point operation to be dealt with at the other. This is on the principle seen in other installations in Italy, whether of relay or lever type.

Snowstorm Troubles on the Pennsylvania Railroad

DETAILS now are available of the difficulties on the Pennsylvania and other railways in the eastern U.S.A. caused by the blizzard in mid-February. This covered approximately the area between Buffalo and Pittsburgh in the west and New York and Baltimore in the east. The combination of very fine powdered snow, very low

temperatures, and high winds resulted in drifts of up to 20 ft.; tracks and points were blocked with snow as fast as they were cleared. The fine snow crystals penetrated the air intake screens on the electric locomotives, entered the traction motors, melted, and shorted them. By the morning of the third day of the storm 134 out of the 139 "GG-1" type electric locomotives, the mainstay of the Pennsylvania main line, were wholly or partially disabled. Nothing of the kind had been experienced before on the electrified sections. Diesel-electric locomotives had to be brought in from the company's western lines and borrowed from other railways.

Signalling in U.S.A. in 1957

ALTHOUGH there was in 1957 a little less signalling construction work on lines in U.S.A., compared with 1956, figures were nevertheless above the average for the period 1954-1957; it is expected that much work will be carried out during the present year. Appreciable reductions in operating costs are imperatively necessary and improved signalling offers means of achieving them in large measure.

Special financial arrangements can be made with industry, as is done in the case of the supply of new rolling stock to assist in obtaining the necessary signalling apparatus. The use of diesel locomotives has brought higher average speeds and thus signalling sections are occupied for less time than formerly. The process of singling double lines and reducing the number of tracks on three- or four-sections is being continued with the aid of greatly improved signalling. Much work of this kind was undertaken by the leading railways in 1957. More scientific location of running loops and determination of their length, with points able to be taken at speed on the diverging route, have effected remarkable improvements in the operation of the many single-line sections. C.T.C. over all points and signals at the loops was provided for 1,680 route-miles of which 1,327 were single, during the year. The longest individual installation covered 156 miles, all single line. Improvements continue to be made in methods of effecting the controls in these systems and also in the dispatcher's machine itself, so as to make it easier for him to deal with a long length of route from a small desk. These improvements in apparatus include simplified arrangements for routes where traffic does not justify the fuller ones as seen hitherto, and many managements have plans to apply them.

Ordinary interlocking work, including the automatic form for the crossings referred to, did not include many installations of any size. The largest comprised 82 signals and 78 sets of points, and totalled 77 with 29 others rebuilt during the year; none of these included more than 24 signals. Plain automatic signalling of well-known type was provided on 170 miles of single and 95 of double line, a relatively small amount. Road crossing protection was, however, again considerably extended with over 1,600 installations, the greater number with flashing lights only and no barriers. Where these replace watchmen, savings sufficient to pay for the work in two years frequently are realised. Employment of fewer men on the permanent way, who formerly could be relied on to notice defects in passing trains, and direct trainmen's attention to them, has given rise to devices which detect such things as hot boxes, broken wheel flanges, dragging or equipment hanging down; if desired, they can be made to exercise control over the signals. Many such devices are giving good results.

There were many further improvements in marshalling yard equipment, this is becoming continually more automatic; in some yards in the U.S.A., as in Europe, it is to all intents and purposes completely automatic. At great cost in research, electronics have been applied to a great degree to measure all the variables involved in dealing with each wagon and to control it. Tape recorders, both punched and magnetic, have been applied to control point operation, and wireless-directed electric pushers, a form of shunting engine, to move vehicles locally when necessary.

Railway Wages Award

THE statesmanlike decision of the Railway Staff National Tribunal on railway wage claims is remarkable in several ways. The rejection of the demands of the three railway trades unions, on the ground that the British Transport Commission cannot afford the money, has introduced a new and wholesome concept of the obligation of a nationalised industry as to the payment of higher wages. All the parties to the dispute are showing restraint in a difficult situation, not least for the union leaders, in an attempt to maintain industrial peace.

There has been hitherto a feeling that because an industry is State-owned, the State must find the money to pay the staff at a level which is deemed equitable on grounds not connected with the ability of the industry to pay, when the industry itself cannot do so. This view, which has not been shown to have any rational basis, and merely enunciates a proposition on ethics, does not take into account the statutory obligation of the Commission to pay its way. It was expressed in January, 1955, by the Court of Inquiry into railway wages under the chairmanship of Sir John Cameron. It appears moreover to be implicit in the recent wage awards to nationalised transport staff, though it might be argued that when these were made, the financial situation of the British Transport Commission was less adverse than it is now.

The attitude of the Tribunal as revealed in its latest decision is completely realistic. For the first time for many years in any decision on wages by a court of arbitration, it has investigated the financial situation of the employers, and rightly found that an insurmountable obstacle to paying higher wages. It has gone into the possibility of raising railway rates and fares, and finds that even if such a step were practicable and commercially prudent, it could not produce enough revenue to meet increased costs for wages or anything else, after being used to keeping the deficit for 1958 within the maximum limit originally contemplated. Weight is given to the statutory inability of the Commission to borrow more than £250 million, against which it is already being forced to borrow sums which exceed £110 million, to meet liabilities in 1956 and 1957. What the Tribunal terms the "drastic and damaging curtailment" of railway activities which must result from granting wage increases has been considered and adduced as an additional reason against them. On the other hand it has examined the evidence as to the level of wages on the railways compared with those in other nationalised industries, public services, and some private undertakings. It finds them low in comparison; it does not enlarge on this fact. The inability of the Commission to pay is accepted as over-riding.

Both the majority finding by the Chairman, Sir John Forster, and by Mr. A. J. Espley, who was selected by the Commission, and the minority finding by Mr. E. Hall, who was nominated by the three railway trades unions, are well worded. They contain nothing which either party can criticise adversely in principle, except the divergent findings as to the obligation to pay higher wages when the Commission has not the funds for the purpose, without infringing its mandate and incurring grave risk of untoward economic consequences. It is on this matter of principle that Mr. Hall mainly dissents; though he also stresses the adverse effect on morale of being paid at basic rates low in comparison with other industries, and of staff who "could not rely upon an independent tribunal to restore their declining purchasing power."

The decision, however sound, does not solve the problem of railway wages. It is no fault of the Commission that its financial situation is no better than it is. Great efforts have been made to increase efficiency through the modernisation plan. The Government has, unfortunately, found it necessary to slow down, by restrictions on advances of money, the rate of implementing the plan, and before it had got into its stride. Even if there had not been this deceleration, it is most unlikely that implementation of the plan, which is essentially a long-term measure, by now would have resulted in a measure of prosperity sufficient to justify wage increases. When the claims were first made

by the three railway unions, traffics already were falling to some extent as the result of a contraction of national industrial and commercial activity. The hearing by the Tribunal took place in a climate of recession. The award will have had one useful result if it induces the Government by arranging for earlier advances to make possible acceleration of the rate of carrying out the modernisation plan, but this could result in no rapid improvement in the situation. A great deal of attention for some time has been directed to effecting economies on British Railways; the measures proposed and sometimes put into effect include closings of unremunerative branch lines, some of which have encountered considerable opposition from sections of the public. It is impossible to see how money could be found for higher wages, short of reducing services.

It is clear that all concerned are making every effort to exercise moderation and not precipitate a graver situation by causing disruption. The unions seem to appreciate, more now than on previous occasions, the dangers of industrial strife. The effects of a withdrawal of labour would be catastrophic and long-lived. The resultant need for economy would result in permanent suspension of railway services, which apart from causing unemployment among railwaymen would seriously damage trade and industry and the general public that rely on railway goods and passenger transport. There is a desperate need for moderation on the brink of economic disaster.

The outcome of the dispute is of the utmost importance to the nation. The way in which this question is solved, in so far as any radical solution is possible in a short period, will set a precedent for industry in general. The Government, not for the first time, is using the railways as a testing ground. To judge by previous statements by the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, it will stand by the finding of the Railway Staff National Tribunal.

The provisions of the Budget should go some way to stabilise the cost of living, and therefore ease the situation of railwaymen. Although it is a good Budget from the point of view of the national interest, it proposes no step, for which the Commission and the three railway unions doubtless have been hoping, which might afford an answer to their problem. It gives no encouragement to hopes that the Government will make possible an increase in the speed of implementing the modernisation programme. As there is some relaxation in certain directions in the field of public investment, there is surely a case for taking every possible step to ensure that modernisation is pressed forward, so as to give trade and industry the advantages of a highly efficient and economic railway system at the earliest opportunity.

The Rhodesia Railways

THE report on the Rhodesia Railways for the year ended March 31, 1957, a copy of which we have received from Mr. J. W. S. Pegrum, the General Manager, shows a level of activities on a scale higher than ever before. For the first time for many years virtually all demands for rail transport were able to be met, and new records in tonnages of general goods, coal, coke and all the principal minerals carried were established. As compared with 1955-56 there were percentage increases in the following: passengers carried 4.3, general goods 9.3, coal and coke 11.6, chrome ore 45.0, copper 13.5, and asbestos and other minerals 4.6. Road motor service passengers also increased by 8.2 and goods by 16.9 per cent.

The total earnings for the year, £27,920,458, were the highest on record and 15.6 per cent higher than in the previous year. Working expenses, including provision for depreciation and renewals, totalled £23,175,652, 14.3 per cent higher. This satisfactory state of affairs was achieved despite increased cost-of-living allowances and other awards being implemented, and increased contributions for renewals and on other accounts.

During the year under review the installation of Centralised Train Control on the North line continued

and by its end 103 miles had been fully opened with power-worked points introduced for the first time. Extension of C.T.C. over the whole main line from Umtali to Gwelo and Zimba to Noola was sanctioned during the year. A new avoiding line between Wankie and Thomson Junction and a branch line from Luano to Bancroft were both opened in January, 1957. Seventeen new crossing loops were also constructed.

Seven diesel-electric locomotives were received during 1956-57, and one twin-diner and one buffet car were built in the mechanical workshops. The wagon stock totalled 11,728 at the end of the year, an increase of 2,074 vehicles. At that time also there were 46 Beyer-Garratts and 12 diesel-electric locomotives, 88 passenger vehicles and 125 wagons on order. Thanks to the receipt of the additional diesel-electric locomotives, the whole train service between Umtali and Salisbury was able to be worked with diesel power and latterly one or two trains were worked daily from Salisbury to Gwelo; faster services also became possible, due to diesel power and relaying with 80-lb. rails. Traffic over the South East line increased, various minerals being diverted over that route.

The following are some of the year's principal results:—

	1955-56	1956-57
Miles open	—	2,722
Gross ton-miles (thousands)	8,767,243	9,497,256
Average haul (miles)	407	397
Train-miles (North of Bulawayo)	11,862,954	12,503,830
Tonnage conveyed:		
General merchandise	4,387,330	4,794,340
Coal and coke	3,332,117	3,718,119
Minerals	2,345,684	2,588,698
Total	10,065,131	11,101,157
Total passenger journeys	3,982,761	4,155,526
Receipts:	£	£
General merchandise	13,103,432	14,189,191
Coal & coke	2,783,520	3,175,671
Minerals	4,929,753	7,034,488
Coaching	1,987,600	2,003,519
Road motor	679,088	775,253
Total revenue	23,540,828	27,191,706
Total expenditure	18,280,328	21,288,436

Railways as Steel Users

NEXT to the National Coal Board, British Railways is probably the largest direct customer of steel produced in this country; in 1956 they used about 7 per cent of the total output. The corresponding proportions of the total steel output used by railways of Western Europe, and of the whole world, are 6.4 and 8.7 per cent respectively. These facts emerge from a paper read to the Institution of Locomotive Engineers on Wednesday, entitled "Steel for Railway Purposes." The authors are Mr. J. Dearden, Assistant Superintendent, Metallurgy Division, British Railways Research Department, Derby, and Mr. J. E. Roberts, Research Department, Colvilles Limited, Motherwell, Lanarkshire. Of the railway requirements in this country, bars, sections and other heavy rolled products together accounted for 31 per cent of the total, with rails and fishplates a close second at 27 per cent.

After reviewing the common methods of manufacturing steels in Great Britain, and the types of steel generally available, the authors discuss particular mechanical engineering features and grades of steels which might help in the solution of problems which have been experienced. In the case of locomotive plate frames, the production of plates up to 1½ in. thick for such components does not present any real difficulty. Up to now, mild steel has been the common material, with a few examples of the use of a 35/45 ton tensile steel for high speed locomotives. The problem of applying the high-tensile steels, the authors of the paper point out, is twofold; the increase in tensile strength has no effect on the value of the elastic modulus of the steel, and where stiffness is important, care in design is needed to make full use of the enhanced tensile strength. The other aspects requiring careful consideration are the weldability of the steel, and its fatigue behaviour.

The most frequent cause of failure in locomotive frames seems to be fatigue cracking from the corners of the horn openings; Mr. Dearden and Mr. Roberts speculate on whether a notch-tough steel, with its inherently greater resistance to cracking from stress concentration and under the influence of stress set-up during gas cutting or welding, would improve life by avoiding such failures. They point out that although the fatigue resistance of the notch tough steels, as measured by carefully prepared notch fatigue specimens, is apparently no better than a normal mild steel, their toughness may well avoid the formation of an initial crack due to some other factor which would subsequently spread by fatigue. This has in fact been tried in some cases, but no details of subsequent service behaviour are available. In the absence of definite results, they can only assume that satisfactory performance was obtained.

The benefits which can follow from standardisation of steels for specific purposes is shown by a survey of 10 of the leading manufacturers of diesel engines regarding eight of the principal steel components of an engine. This shows that no less than 32 different grades are specified; in the case of a corresponding five components in British Railways steam locomotives only seven grades of steel are specified. Although this may not be a strictly accurate comparison, it does seem that this state of affairs will have to be tolerated, at least for the time being, while British Railways continue to order a variety of diesel locomotive types from a large number of manufacturers, each of which has its own ideas regarding choice of material for the components of its products.

A warning is given in the paper that the nature of the steels used in the diesel engines is such that there is a need for caution in the methods of executing running repairs. Many of the steels are carefully heat-treated during manufacture, and haphazard handling may well ruin their properties. Similarly, odd tack-welds may lead to early and expensive failures of the high-strength steels.

The part which careful design can play when employing the well-known low alloy high-tensile steels for carriage construction is emphasised; in structures where the dynamic stresses are low compared with the static stresses, or where fatigue failure is unlikely, these low alloy high-tensile steels provide opportunities for saving weight in the design of structures. Care, however, must be exercised in the design for, as the elastic modulus is the same for all steels, the slender sections used in high-tensile steel designs are more liable to flexure than the more substantial designs in mild steel. The combination of this flexibility with the rigidity of welded joints (compared with riveted joints) results in sudden changes in rigidity which are liable to localise the flexing and thus produce fatigue flaws. These difficulties may be overcome by obtaining the required rigidity and reducing the stresses at welded joints by changes in design. One way of achieving this objective is to consider the whole body and underframe as an integral unit, and use suitably formed corrugated sections to obtain the necessary rigidity. This has, in fact, been done in some recently completed two-coach diesel railcar sets, in which some of the side-frame components are of high-strength steels.

On the question of corrosion of steel wagons, the authors point out that tests show that considerable increase in life can be obtained from using a mild steel containing at least 0.2 per cent copper. One instance of hopper wagons used for washed coal traffic fitted with panels of this material shows that the loss in thickness is 40-60 per cent that of normal mild steel.

The subject of rails versus tyres is dealt with at some length. An overall estimate of the total cost of normal maintenance of all tyres and rails for a year in the London Midland Region shows that the ratio of weight of metal removed by wear and/or machining, where applicable, of rails is 2.4 times that of wheels. The relative cost is, however, 1.8 times as much.

Part of the paper is concerned with failure of steel railway components, among them, rails. This last topic was dealt with in greater detail by Mr. Dearden, in an article which appeared in our issue of November 1, 1957.

Progress in China

(By a correspondent)

THE completion of the First Five-Year Plan and the onset of the Second Plan is an appropriate moment to review the progress made in railway development in China. An article in the January 10 issue of *The Railway Gazette* brought the story up to date for the latter half of last year; but since then many further developments have taken place and future plans are becoming clearer. The last five years, from a railway point of view, have been most satisfactory. The heavy damage done by the Japanese and civil wars has been repaired, central workshops modernised, locomotives and rolling stock restored, and through running re-established. The morale of the staff has been raised to a very high level and, perhaps as a result, a record of train punctuality as high as any in the world has been set.

Besides this work of restoration a big programme of improvement has been carried out. Bridges have been strengthened or replaced on many main lines to increase their strength from Cooper E-35 or less, to Cooper E-50, which permits axleloads of up to 23 tonnes; 90-lb. rails are replacing old or lighter rails wherever necessary; and 2,500 miles of new track have been laid, of which 2,000 miles are new trunk lines. The economic advance of China has resulted in increasing traffic on the railways. This has been moved, wherever possible, by augmenting the weight of trains. In some cases C.T.C. and colour-light signalling also have been adopted. More radical, however, are the 900 miles of double tracking which have proved essential and which should be completed within the next few months.

The most spectacular of the railway improvements have been the completion of the Yangtse Bridge, the building of a line across the Gobi Desert joining the Trans-Siberian Railway; the extension of the Great Western line to the borders of Sinkiang Province, 1,900 miles from the sea; and the introduction of the large 2-10-2 freight locomotives with a tractive force of 63,000 lb. The Yangtse Bridge is the culmination of many years, indeed many centuries, of endeavour. The Chinese have always been famous as bridge engineers and the Yangtse Bridge is the latest, and certainly not the last, example of their skill. Although they studied British and other foreign designs, and were glad to avail themselves of Russian assistance in sinking their pier footings by percussion rather than by building coffer-dams, it was Chinese steel, skill, and labour that built the bridge.

The 2-10-2 "Peace" locomotive was briefly described in the issue of February 22, 1957. It is intended to take freight trains of 4,000 tons, or even more on certain sections of track. Another change, less remarked but also important, is the supersession of the former 40-ton standard wagons by 50-ton covered and 60-ton open wagons, which improves the ratio of tare-weight to carrying capacity. A considerable number of 30-ton wagons is being built for special traffic.

To ensure punctuality on single lines, running speeds, both passenger and freight, have hitherto been comparatively low, but a steady improvement in this respect is taking place. The winter timetable shortened the running time of the Peking-Shanghai express to 27 hr. over a distance of 890 miles, which includes the crossing of the Yangtse at Nanking by train ferry. The Spring timetable has now cut the running time between Nanking and Shanghai from 5 hr. 2 min. to 3 hr. 52 min.; that is to say, an average speed of 50 m.p.h.; considering that the passenger train weights on that section often exceed 750 tons, that is no mean feat even for the 4-8-4 British-built locomotives in use.

The completion of the Yangtse Bridge has resulted in the amalgamation of the Peking-Hankow and the Canton-Hankow lines into the Peking-Canton Railway and has caused the complete reorganisation of the lines around Hankow (Wuhan). On the north bank of the river, the line is to be moved more than a mile northwards to allow the city to expand; this will entail the demolition of the present Peking-Hankow Station, and a

new Main Station with marshalling yards and depots will be built on the south bank of the river. Through-running between Peking and Canton, 1,445 miles, means that for the first time in history daily trains are running between latitude 40 deg. N. and the tropics. The extremes of climate and temperature encountered range between 10° F. below zero in Peking during the winter to the hot, moist climate of a Canton summer. These set a difficult problem to the carriage designers, and air conditioning seems to be the final answer.

Future developments will not be known in detail until the Second Five-Year Plan is published, but already certain major points have been decided upon. The Paochi-Chengtu Railway, completed two years ago, will have the hill section through the Chin Ling Mountains electrified at 25 kV., 50 cycles. This line links the Great Western Railway with the capital of Szechuan Province. A line 670 miles long is now being built from Lanchow, on the

same railway, to Paotou, the great new steel and industrial centre near the Mongolian frontier. A third line is being built from the Chengtu-Chunking Railway, southwards to Kunming (Yunnan), not far from the Burma border. These three lines together will make a new trunk line from the far North of China to the extreme South, and open up new country throughout. The Great Western Railway itself will, it is expected, be extended a further 1,000 miles through Urumchi to the Karamai oilfields, and to a junction with the Soviet Turk-Siberian Railway.

These new lines and the estimated further increase of traffic will make more locomotives and rolling stock essential; the present plan is to build 2,300 locomotives, 5,000 passenger cars, and 40,000 wagons. Besides the Paochi-Chengtu Railway, the hill sections of the Peking-Tatung and Tatung-Taiyuan Railways will be electrified. The next big bridge in China will be across the treacherous Yellow River.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Passenger Coach Design

April 4

SIR,—I was very glad to see that Mr. E. A. K. Jarvis, in his letter published in your March 14 issue, has raised the issue of the discomfort to passengers in the open saloon-type coach now in use on British Railways.

I protest strongly against this type of coach on long-distance services because of insufficient width of seat for a grown person; the difficulty of access to and from the outside, or window, seat; the cramping effect on one's legs when stuck between the table, the side of the coach, and another passenger; and the paucity of luggage rack space per passenger in a full coach.

I suffered from all of these defects on a recent trip from Kings Cross to Bradford in the "West Riding" last week. Having booked window seats and joining the train just before its departure, a colleague and I found that a young couple had already filled the racks with their luggage, and so on, and covered the table with their sundries. We had to put our cases and coats at the doorway and clamber over mountains of other passengers' cases strewn down the centre aisle.

Of course more passengers can be crammed in with these abominable coaches, but the comfort of the fare-paying public should also be considered.

Yours faithfully,

H. M. MACINTYRE

2, Silverhill Drive, Bradford, 3

Ten Weeks of U.S.A. Railroading

April 5

SIR,—In a report on the transport situation of March 8, the Association of American Railroads throws more light on the industrial recession than any official statement emanating from Washington, D.C. In the first 10 weeks of this year 5,370,370 railway wagons were loaded with revenue freight. The number was 1,186,770 below the 1957 figure (18 per cent) and 1,501,630 under 1956 (nearly 22 per cent). During the period coal output was less than in 1957 by 19.8 million tons (20 per cent), and consumption in January was six million tons lower (14 per cent). In January and February overseas coal shipments dropped by 2,158,550 tons (23 per cent). In the month of February the volume of export and coastal freight, apart from coal and coke, passing through the ports decreased by 26,095 wagon loads, or 28 per cent.

All groups of commodities produced fewer wagon loads in the 10 weeks. Coke loadings were almost halved, falling from 133,790 to 69,460. That decrease of 48 per cent, together with a decrease of 67,050 in ore loadings

(31 per cent), was a sign that steel plants worked at little more than half capacity. High rated traffics such as manufactured goods and "smalls," which furnish the loads of 60 per cent of all wagons forwarded, filled 778,385 fewer wagons this year, a decrease of nearly 20 per cent. The number of flat wagons conveying road trailers was down by 1,657, or 3.6 per cent, showing how general the loss of freight tonnage was. The railroads owned 4,780 more serviceable wagons on March 1 than a year ago, but had 101,280, or 5.8 per cent of stock, under repair against 71,740 (4.2 per cent) last year. There still was an average daily surplus of 100,000 wagons this year.

Snowstorms swept down on several of the States this winter and damaged much rolling stock. On March 1 no less than 545 of 2,153 steam locomotives in stock were under repair and of 586 electric units 110, or over 18 per cent, were unserviceable. Diesel units stood up better to the wintry blasts, only 1,172 out of 27,507 (4.2 per cent) needing repairs; this is the first time for many months that the diesel under-repair percentage has been above 3.8.

It is bad luck that the railroads have to cope with abnormal repairs at a time when they are striving to keep down operating expenses. For the month of January these expenses were reduced from \$688 million in 1957 to \$650 million, or by 5.5 per cent. Operating revenues, however, decreased by 9 per cent from \$855 million to \$778 million. The operating ratio rose from 80.4 per cent to 83.5 per cent and net income (after charges) fell from \$40 million to \$26 million, or by 40 per cent. This year may be as difficult for the railway industry as the lean years 1954 and 1949.

Yours faithfully,

R. BELL

Clacton-on-Sea

Steel Prices

April 11

SIR,—Your comment in your April 4 issue that the reduction in steel prices is to be welcomed will have the agreement of most steel users. However, it needs to be borne in mind that at present steel prices are nearly three-and-a-half times prewar level; and, allowing for the change in the value of money, they are some 25 per cent higher in real terms than they were in 1938.

The railways would no doubt welcome a reduction in steel prices to something like their real level in 1938, particularly as railway receipts per ton-mile for mineral traffic, much of which is carried for the steel industry, have if anything been reduced in real terms below the prewar level.

Yours faithfully,

D. W. GLASSBOROW

13a, Connaught Street, W.2

THE SCRAP HEAP

No New Thing Under the Sun

No sooner do we get quit of one labour trouble than another feature begins to loom on the horizon.—From *"The Financial Times"* of April 5, 1898.

Straw Hats for Export

A hundred years ago, on April 5, 1858, the railway from Luton (Bute Street) to Dunstable was opened for goods traffic. Previously, Luton was said to be the largest town in England without railway or canal facilities. Its population had increased by 84 per cent. in 10 years, mainly in connection with the manufacture of straw hats for export. The railway was a Luton enterprise, with local townsfolk and gentry subscribing three-quarters of the capital.

Argentine Centenary Celebrations

The locomotive and carriages depicted in the accompanying illustration were exhibited at the Plaza Constitucia terminus of the former Buenos Aires Great Southern Railway on the occasion of the centenary celebrations of the Argentine Railways last August.

The 2-6-0 locomotive was supplied to the Buenos Aires Great Southern Railway in 1886 by Beyer, Peacock & Co. Ltd., and was of a design built for the Buenos Aires & Rosario Railway in the same year. The two six-wheel coaches, built by Metropolitan-Cammell Carriage & Wagon Co. Ltd. in 1884-85, are now used for inspection purposes. The four-wheel brake van was built by the Birmingham Railway Carriage & Wagon Co. Ltd. about 1888.

The locomotive bears a very close resemblance to its appearance when new. An extended smokebox has been fitted; the covers originally enclosing

the slidebars have been removed; the oil headlight has been replaced by an electric one; and the tender has been modified. Otherwise the engine is outwardly much the same as when it left the Gorton works over 70 years ago.

The Chicken or the Egg?

Extract from accident final report: Responsibility not accepted. Track unsuitable for "29" class locomotives.—*District Motive Power Superintendent, November 15, 1957.*

Responsibility not accepted. "29" class engine unsuitable for the track.—*District Engineer, November 16.*—From *"East African Railways & Harbours Magazine."*

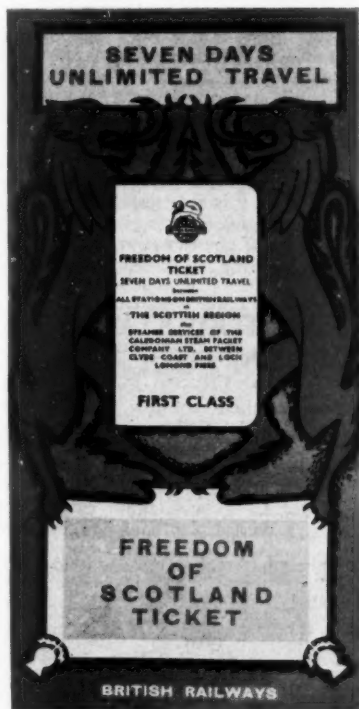
So Bracing

About this season of the year does one welcome a rash of pictures of the seaside which reminds us that the time has come to be thinking about holidays—though the blue of the sea and the gold of the sands and the contours of the bathing belles are all, alas, unbelievably idealised.

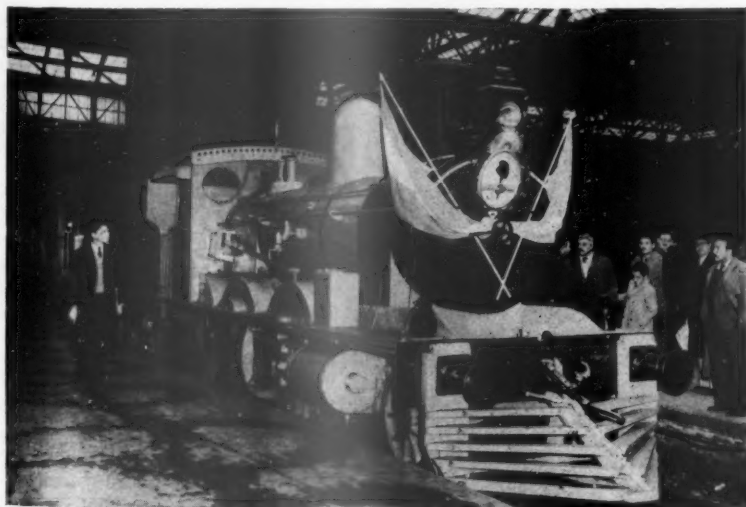
We ought not to forget the men who began it all. To forget, for instance, that when the Great Northern Railway ran a series of excursions from King's Cross to the Lincolnshire coast at Easter just 50 years ago—at 3s. return—they issued for the first time a poster that has been in use ever since. It was a picture of a jolly, rounded fisherman bounding along a lovely stretch of sand. "Skegness," it pointed out, "is so bracing." John Hassall, the "king of poster artists," had sold the original to the railway company for £12 or so. He said himself that he had done better work, but nothing he produced can have given such pleasure to so many over the years.—From *"The Times."*

Scottish Region Publicity

The illustration below shows the cover of a folder issued by British Railways, Scottish Region, to publicise the "Freedom of Scotland" seven-day unlimited travel ticket. The design and colour scheme are striking. The lions are scarlet on a light ("Caledonian") blue background; the panels at top and bottom are yellow and the lettering thereon red; and the facsimile of the ticket is white with black lettering.



Cover of folder featuring the "Freedom of Scotland" seven-day unlimited travel ticket



Beyer, Peacock locomotive with Metropolitan-Cammell and Birmingham rolling stock, all built in the 1880s, during the Argentine railway centenary celebrations last August

Home Station

(A messenger at Paddington has been negotiating purchase of Little Kimble station house)

A railwayman, now due for pension, Has hit the news with his intention To purchase for his habitation A country branch line railway station. You need not fear that he'll be fretting In this so truly rural setting; The stopping trains are twenty-four Per day, or less, or, maybe, more. When he's installed in his "mod. cons.," Heedless of signal "offs" and "ons," And ere his arteries start to harden, He aims to cultivate his garden. Untroubled by rough-shunted trucks, Happy at Little Kimble, Bucks. With bags of transport at his door, What railwayman could ask for more?

A.B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Quadrupling near Johannesburg

Work has started on the £7,000,000 project which provides for the quadrupling of the Elandsfontein-Kaalfontein section of the Johannesburg-Pretoria line, and the building of a new electrified double line from Kaalfontein Station to the native township which is to be established on a site five miles south-east of Kaalfontein Station.

The quadrupling of the Elandsfontein-Kaalfontein section is estimated to cost £3,000,000, which includes the building of a new station at Kempton Park and the reconstruction of the station yard. A start has been made on the earthworks, broadening of the foundations, alterations to certain culverts and it is expected that the work will be completed during 1961 when the last stages of the new line will be proceeded with.

UNITED STATES

"RDC" Railcar Record

The first two Budd-built diesel-hydraulic railcars of the "RDC" type to complete 1,000,000 miles of running are those which were introduced on the Western Pacific Railroad in 1949, both of which have run off this mileage in eight years. Their length of journey also is a record, for each makes three

round trips weekly over the 924 miles between Oakland Pier (San Francisco) and Salt Lake City. Included in the run, eastbound, is a length of 104 miles climbing continuously at 1 in 100, and the cars operate in variations of temperature from 110° F. to 30° F. below zero. With seating for 66 passengers these cars replaced a steam train hauled by a 4-8-2 locomotive, and by their economical operation have cut the loss on the steam working by \$700,000 annually. They have had a 95 per cent record of punctual arrivals, and an all but 100 per cent availability record.

ARGENTINA

Delivery of Diesel Locomotives

Eight of the 20 general-purpose, 1,200-h.p. diesel-electric locomotives ordered by the Argentine State Railways for the General Urquiza Railway have been delivered by the General Electric Locomotive & Car Equipment Department at Erie, Pennsylvania. The rest are to be shipped shortly.

FRANCE

"Towveyor" at Lyon-Guillotière

At Lyon-Guillotière a large undertaking handling the bulk despatch of smalls traffic under the groupage system, rents a new loading platform from the

S.N.C.F. To help sort and load more effectively the large volume of traffic handled, a "towveyor" mechanical handling system has been installed. This consists of small, four-wheel trollies which circulate around the loading area by means of an underground conveyor chain worked by an electric motor. The trolley is linked to the chain by a movable spindle, and the speed of the conveyor can be regulated according to need.

Letters Dictated by Telephone

During the past four years, there has been a steady development at the headquarters of the South East Region of the S.N.C.F. of a system whereby staff desirous of dictating letters and documents to be typed can make use of a telephone connection to a central dictaphone receiving office. By dialling, a connection is obtained with this central office and, if a machine is free, the matter to be typed can be remotely recorded on a magnetic band. By means of a reading machine the typist can type the information, the process being similar to that used with the more usual type of dictaphone. Provision is made for correction of dictation errors.

BELGIUM

S.N.C.F. at Brussels Exhibition

French National Railways are to display several exhibits at the Brussels Exhibition in the French Pavilion; they are co-operating with the French Government to show the value of the railway industry to the national economy.

To show the importance of the S.N.C.F. in the European transport system, S.N.C.F. vehicles, representative of the most modern techniques, will be amongst the 50 vehicles on view on the U.I.C. stand in the Transport Pavilion. These will include electric locomotives and multiple-unit vehicles, diesel locomotives and railcars, recent types of wagon, and a stainless steel passenger coach.

DENMARK

New Passenger Stock

The State Railways have taken delivery from Scandia, of Randers, 10 first class passenger coaches, of the open type. Each has 40 reversible and adjustable seats in the smoking and 16 in the non-smoking saloon, two seats abreast on each side of the centre gangway. The windows are exceptionally wide.

On the backs of the seats are pockets for newspapers and so on. The upholstery of seats is reinforced with leather on the armrests. The interior panelling of saloons is in hazel. Plastics are used for floors, for walls and partitions in the toilets, and for the lower part of the roof over the baggage shelves.



Interior of Danish State Railways first class reclining chair coach, built by Scandia; note pockets in back of chairs, and foot-rests

*Seventeenth International Railway Congress***Planning services for Electric and Diesel Traction***Transport of more passengers with lower train-mileage points way to future organisation*

MONSIEUR R. CARLIER, of the headquarter staff of the Belgian National Railways, has prepared the report on replies to Question 6 before the International Railway Congress Association based on practice on railways in European countries and in certain overseas territories associated with them now, or having had such associations in the past. The report on the replies on this question from railway managements in English-speaking countries or those which in general follow British practice was the subject of an article in our April 11 issue. This year the U.S.S.R. has replied to the questionnaire addressed to railway managements, so that the report is able to review its subject with reference to Europe, Asia and Africa. Question 6 calls for investigation into the principles conducive to a rational and efficient organisation of passenger train services when changing over to electric and diesel traction.

The reporter comments at the outset on the extent of the move away from steam traction. His survey covers complete replies from 15 administrations, responsible for 75,000 route-miles. In 1938 steam traction was used on 80 per cent of this mileage, whereas by 1955 electric or diesel power was operating on more than 50 per cent of it. Although the extent of the changeover varies widely between different countries, none of the replies questions the need for it, and where steam traction has been retained partly or wholly, this is for extraneous reasons such as lack of electric power or of the capital needed for rapid conversion.

Social changes, such as improved living conditions and holidays, have resulted in an average increase in passengers on the lines studied of 62 per cent compared with 1938, with individual increases ranging between 24 per cent and 230 per cent. In general the average user of trains has increased. In France the index in 1955 of train-km. was 68 (1938 = 100), while the percentage of seat occupation in second class coaches at 90 per cent, is higher than on any other system. In Belgium the train-km. index in 1955 was 90, but this is tending now towards 100. The pre-war Belgian train service, with at least a train an hour on each main line, has proved a heavy burden, but with 17 per cent of their lines electrified, the railways are moving back towards the 1938 service density, assisted by lower traction costs and increase in patronage of the trains.

A fall of 6 per cent in average user in the U.S.S.R. is thought to be due to the anxiety on the part of the management to ensure that improvements in

train services shall be shared even by the thinly-populated areas. In their reply, the Russians declare that "on the local lines it is possible for the passengers to make short journeys (less than 180 miles) each hour of the day."

Progress in Passenger Comfort

Although the user of trains has increased, so has the space allotted to each passenger, particularly in lower class travel. This means that trains of the maximum practicable length will accommodate fewer passengers than in the past, which will lead to a quicker intensification of services if the number of travellers continues to grow. Monsieur Carlier suggests that this factor may place a limit on the extent to which this method of increasing comfort can be pursued.

For short journeys of about an hour, open type carriages are the general rule, and it is recommended that seats in the lower class should be upholstered. Only a few railways provide refreshment service from a trolley on journeys of this order. Compartments or adjustable seating are favoured for journeys over 3 hr., with a snack bar or its equivalent, and a restaurant car available at meal times. All administrations agree that sleeping cars or berths are necessary on night journeys, some recommending them for runs of 5-6 hr., while others begin to provide these facilities when the journey time is 7 or 8 hr.

Changes in speed of travel were not marked. Of the 15 administrations which completed the questionnaire, three showed reductions of speed of the order of 3 m.p.h. compared with 1938; nine reported slightly higher speeds; and only three attained definitely higher speeds in 1955. Two of these recorded accelerations of 25-80 per cent as a result of complete conversion to diesel working of passenger trains. The third, France, has accelerated long-distance trains on the main lines by 9-12 m.p.h. and speeds of 68-77 m.p.h. are being run (on the 1955 returns) with the fastest trains on certain lines.

Average passenger journeys are short and are in close correspondence between the different systems. Ignoring the special case of the U.S.S.R., with its great distances, it seems a fair figure, taking account both of normal travel and mass movements in suburban areas, is 31 miles.

Pattern of Main-Line Timetables

Only the U.S.S.R. among the countries replying can show internal journeys of 1,200 miles and over. This administration quotes its practice on the line from Moscow to Tbilisi, serving

Orel, Kharkov, and Rostov, a distance of 1,553 miles. In summer 28 trains are worked daily in each direction between Moscow and Orel (237 miles), 27 to Kursk (323 miles), and 26 to Kharkov (484 miles). At a point 500 miles from Moscow another line diverges to serve Eupatoria, Simferopol, and Sebastopol (956 miles from Moscow) and over this section eight trains operate. Two trains make the whole journey from Moscow to Tbilisi.

Departures are spread over the period between 9.30 a.m. and 2.50 a.m., but 18 of the trains leave between 5 p.m. and 2.50 a.m., of which 10 depart between 7 p.m. and midnight. All trains include sleeping cars which are at the disposal of passengers travelling for 5-6 hr. by night, and nine of the trains have restaurant cars.

Journeys between 600 and 1,200 miles elsewhere are mostly on international routes. On four of six services listed there is one through train daily; another (Dakar-Bamako in West Africa) operates three times a week, while the sixth is the Paris-Nice run, which has distinctive characteristics. Most European services are characterised by an average speed of about 37 m.p.h., many stops to ensure reasonable patronage over the whole route, and departures mainly in the evening.

The basis of the Paris-Nice service is a day train and a night train (duplicated by a sleeping car train) each 24 hr., with another night service calling at the less important stations along the line. Additional to this basic service is the "Mistral," which makes the journey at an average speed of 62 m.p.h. and is composed of first class, air-conditioned coaches, Pullman cars, restaurant cars and bar cars.

Group and Continuous Services

Services over routes between 250 and 620 miles long are numerous and the traveller always has at his disposal a night train, a day train and very often an afternoon or evening special express service. The latter is timed usually to meet one of the following requirements:—(1) A free morning before departure, and arrival early in the evening, allowing the journey to be continued by night train if desired; (2) a return journey in the day, allowing time for business at the destination; and (3) departure after working hours and arrival early enough to avoid a night in the train.

Since 1957 European international services have included trains in this special class in the shape of the various Trans-Europe Expresses (T.E.E.).

In general, the problem of providing adequate service for intermediate

stations without undue delay to the longer-distance traveller is being met by running several long-distance trains with stops at intervals of 15-30 miles, with one or two high-speed expresses reserved for passengers making long journeys and calling at few, or even no, intermediate stations. Average speeds of the long-distance stopping trains are 30-46 m.p.h., and of the high-speed expresses from 56-62 m.p.h. or higher.

The report then considers traffic over routes of between 60 and 250 miles and observes that here the approach towards a continuous rather than a group service is seen. Night trains are rare, and where run at all they are usually deliberately slow in order to allow reasonable time for rest, but experience shows that passengers prefer a fast train at the end of the day.

Continuous services have now reached their full development between Rome and Naples, and particularly between Brussels and Ostend. Regular-interval departures characterise certain services in Belgium, there being a train every 3 hr. between Brussels and Luxembourg, and hourly between Brussels and Ostend. Ten of the 12 routes considered in this category are either already electrified throughout or will be soon. Refreshment service on the shorter runs is given by snack bars or meal trolleys. Electric multiple-unit stock, not often used for distances over 250 miles, now comes into the picture and has the advantage that train compositions can be varied more rapidly to meet traffic demands than is possible with locomotive-hauled stock.

After a general discussion of train service characteristics on journeys of under 60 miles, the reporter summarises some features of timetables in the Netherlands. The minimum number of trains run daily in each direction over all the lines of the Netherlands Railways is 18. Stops are numerous, but the almost exclusive use of motor coach and railcar stock with high acceleration allows overall speeds of 40-50 m.p.h.

A study of average speeds over varying distances showed a majority result of 50-53 m.p.h. for journeys between 180 and 430 miles; and 43 m.p.h. for journeys of 600 miles. The S.N.C.F., however, considers that the overall speed for 180- to 430-mile journeys should be at least 62 m.p.h., and the same speed is advocated by the Swiss and Algerian railways for journeys of 180 miles.

When traffic permits uniform loading, it is generally agreed that regular-interval timetables are advantageous for distances less than 180 miles. An average loading of 300-400 passengers per train is suggested in some quarters, although a much lower figure would be acceptable with multiple-unit or railcar services. It is considered that the regular interval system is not attractive if the time between trains exceeds two hours. A specific test of suitability for regular-interval service was quoted by

the Belgian National Railways, which are of the opinion that the interval between trains should be less than the time taken to make the journey by car between the two places served. If the traffic offering does not justify a service of this frequency, little value is seen in adopting regular-interval departures.

Operation of Secondary Lines

Most secondary lines carry light traffic, and the services over them have to meet the conflicting demands of local passengers and of convenient main-line connections at the ends of the route. In general, policy is to concentrate on the connections required by the longer-distance traveller. Useful compromises have been reached in some instances by operating road services to supplement trains which are planned to provide major stations on the secondary line with good connections into and out of main-line services. There is growing use of railcars and trailers on routes of this kind, often operating in the intervals between slower steam-hauled trains.

Suburban Traffic

While electric traction predominates on the suburban routes reviewed, there has been progress in improving such services as are still provided by steam trains, particularly by the use of auto-trains which can be controlled in one direction of running from a driving compartment in the leading coach. Mention is made of suburban timetables planned to provide a repeating pattern, such as a fast train from A to D, followed by another from A to C running forward to D; then one from A to B, continuing to C, and so on. It is found that overall speeds on suburban routes rarely exceed 37 m.p.h. and are usually about 20-25 m.p.h.; but these figures are not unfavourable compared with road transport through congested areas. It is not practicable to provide every passenger with a seat at peak periods and most administrations operate coaches with a reasonable number of seats and ample standing space; but in Russia a certain number of vehicles with no seats at all are run in rush hours.

Efforts have been made to spread the peaks by appeals to public authorities and private firms to stagger their hours of work, but usually without success, except in the U.S.S.R. Denmark has begun the experiment of offering reduced fares for journeys made between 10 a.m. and 3 p.m. on Mondays to Fridays.

Conclusions

The reporter looks squarely at the fact that the part played by the railway in the field of transport when viewed as a whole is declining. On the other hand, within its own domain its users have increased. There is some drift back to the railway from the private car for business journeys as a result of congested roads and difficulties of parking. The types of train service where this trend of increasing patronage is

seen are those on routes connecting large centres less than 600 miles apart, and particularly when the distance is under 250 miles; on secondary lines; and on suburban lines. The major efforts of the railway systems should be directed to improvement of their train services in order to retain the traffic they already have, and then to increase the number of travellers.

Many tendencies apparent from study of the replies to the questionnaire are summarised, and general principles deduced. It is observed that the increase in passengers which has continued for several years has not been accompanied by an increase in train-mileage, and that the railways are devoting themselves more and more to long-distance traffic handled by heavy trains, a field in which no other means of transport can compete.

For journeys of over 6 hr. it is considered that the most favourable timetable structure is a night train (or group of trains) leaving between 7 p.m. and midnight; a day train leaving in the early part of the morning for journeys over 16 hours; an afternoon train for journeys of under 12 hours; and a special express service leaving around midday. This special service may be modified to give a morning departure in one direction and a late afternoon departure in the other if the demand at one end of the route favours such an arrangement.

Much effort should be devoted to improving the comfort of rail travel, but avoiding (a) an excessive space per passenger; and (b) too much narrowing of the difference in accommodation between higher and lower classes, which could accentuate the drift from the higher fares.

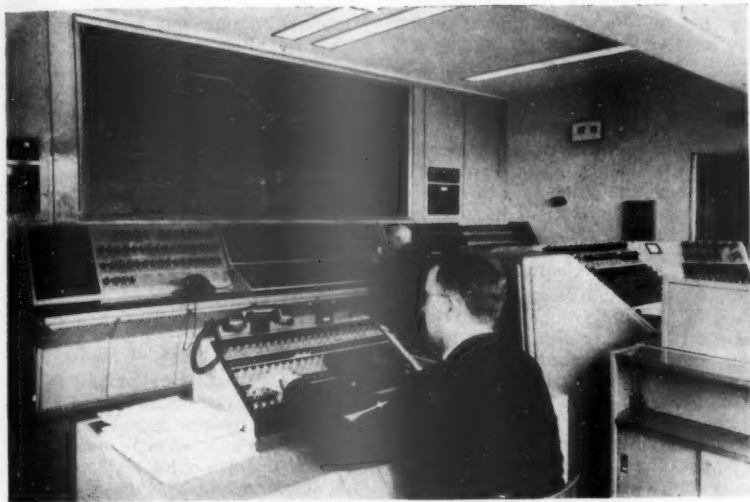
It is considered essential to provide *couchette* or sleeping car accommodation on an adequate scale on night journeys of over 5 hr. A snack bar or trolley refreshment service is recommended on journeys of over 2 hr., while on journeys of over 3 hr. a restaurant car or at least a buffet should be available at meal times.

With reference to the suburban peak-hour problem, Monsieur Carlier suggests that in seeking means for its alleviation advantage should be taken of the common interest which the question now has for public authorities, transport companies and motoring associations. It is urged that experience with any purely railway solutions should be shared as widely as possible.

CLOSING OF STATIONS ON N.E.R. MAIN LINE.—British Railways, North Eastern Region, announce that passenger train facilities will be withdrawn from Alne, Raskelf, and Pilmoor Stations, on the York to Darlington main line, from May 5. Approval has been given by the Transport Users' Consultative Committee for the North Eastern Area. The area is served by buses. Parcels traffic for all three stations will be catered for by British Railways road motor services operating from York or Ripon. There will be no change in the method of dealing with freight traffic.

Power Signalling Installation at Naples

Terminus with 25 platform roads worked from one route relay interlocking box



Interior of route setting signalbox at Naples Central Station. On right, the desk from which the supervisor sets all running routes

THE necessity of enlarging or otherwise improving working arrangements at several stations on the Italian State Railways, in some cases as a result of war damage, has resulted in some power signalling installations of the latest type. Such signalling, both hydraulic and electric, has been used widely in Italy for many years with excellent results. The more recent installations, however, involving continuous track circuiting and often automatic signalling on the approach routes, have incorporated the principles of remote control. By this means outlying junctions are brought under a central supervision, giving greatly improved co-ordination of traffic movements. This conforms with a tendency becoming increasingly noticeable in many parts of Europe. The installations at Bologna were described in our issues for March 27, 1953, and March 8, 1957. Now by courtesy of Signor F. Tolotti, Signal Engineer, Italian State Railways, a description is given of the new equipment at Naples Central Station.

Layout

The rebuilt station has 25 platform lines, of which, however, Nos. 1, 2, 3, and 5 are not yet constructed. Three main routes converge on it: (1) from Cancello, Caserta, and Rome via Casino; (2) from Aversa and Rome via Formia and Foggia; (3) from Torre Annunziata, Salerno and Reggio Calabria. In addition, a line from Villa Literno, Pozzuoli and Piazza Garibaldi, at a lower level, rises to the surface and runs to the Gianturco station, outside the Central, carrying for the most part local services with occasional movements to or from the

main routes. There are also some goods yards, a locomotive depot, carriage sidings, and connections leading to a number of industrial undertakings, with appreciable traffic.

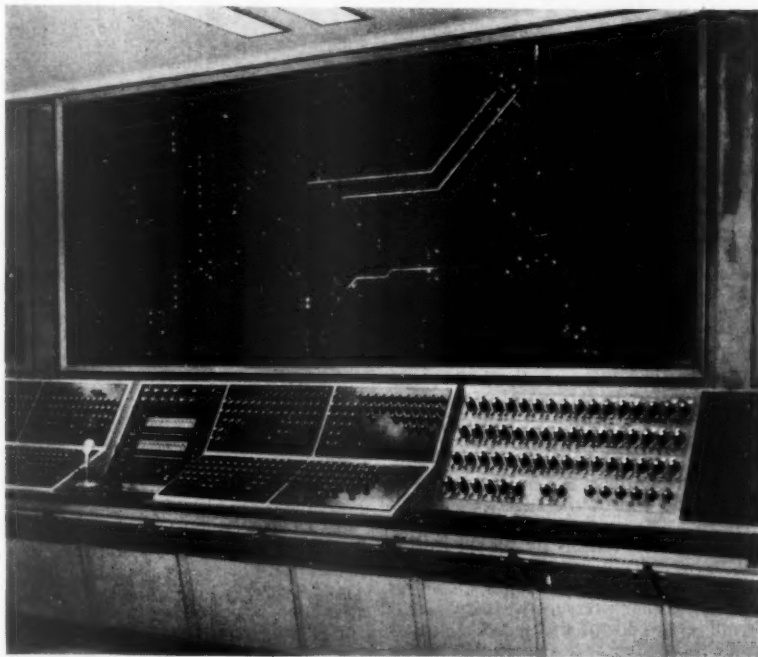
The area suffered extensively in the last war and much rebuilding became necessary. The original 15 platform station had two signalboxes, "A,"

with a 70-lever hydraulic frame, and "B," with an electric one of 110 levers, one of the first all-electric installations on the Italian lines. Both worked on the "individual" system and were destroyed; temporary small signal frames, with points operated locally under key interlocking control, were installed to enable traffic to be carried on. Communication with adjacent boxes at Piazza Garibaldi and the Poggioreale and Marittima junctions was by interlocking block.

Completely new equipment was necessary and traffic requirements were increasing. It was accordingly decided to concentrate the working, including that at the Gianturco station, in one relay interlocking signalbox, with continuous track circuiting, as offering maximum facilities. Developments in this field elsewhere from 1930 had been carefully studied in Italy, and a trial relay type installation was under construction when the war interrupted the work. After the war the boxes at and round Bologna were completed as already mentioned; they gave entirely satisfactory results, both technical and operative.

After consideration of the several known forms of such apparatus and the circuits used with them a push-button system was adopted and applied at Pontelagoscuro and Lavinio, and then in the Naples installation under

(Continued on page 454)



Illuminated diagram and console from which shunting movements are directed and points operated individually should some emergency make it necessary

Oil-filled Hydraulic Buffers

Development of units for railcars and classes of passenger and freight vehicles

MUCH progress has now been made with the development and introduction of hydraulic buffers in this country. Pioneer development work was carried out by Oleo Pneumatics Limited, and testing by British Railways in 1952. After development of a light-weight buffer, which has since been adopted as standard equipment for diesel railcars, a design was produced and developed for a heavy duty buffer, to the standard dimensions laid down by the International Union of Railways (U.I.C.) for vehicles up to the heaviest capacity. Notable feature of this design, of which some 12,000 are now in service, are air-pressure recoil, built-in reservoir, and nylon bearings and seals.

Action of Buffer

When the buffer closes under impact, the oil in the oil chamber is forced through an orifice into the oil reservoir

into the oil reservoir during buffer closure. An initial charge of air at a pressure of 150 lb. per sq. in. is provided in the air chamber; this pressure, with the compression pressure, is used during recoil to return the oil from the reservoir to the oil chamber. Speed of recoil is thus controlled by flow restriction through the orifice. The head of the metering pin is used as the out-stop.

Performance Characteristics

An essential difference between the action of the conventional spring buffer and the hydraulic buffer is that for the same maximum retarding force, the spring buffer starts with a low resistance on impact, rising to a maximum at the end of the stroke; the hydraulic unit starts with a high initial resistance and maintains this throughout the stroke. In this way the maximum energy is

Pneumatic design this characteristic is varied by altering the contour of the metering pin, and from a range of pins available the most suitable pin is selected for the particular application.

A further variant which can readily be arranged is the loading of the recoil spring. It has been found with close-coupled high-speed freight trains that some increase in recoil loading may be desirable to eliminate surge and coupling snatch. As in this buffer, an air spring is used; the recoil loading is readily varied by adjusting the charging air pressure.

Different Types of Buffer

The three types of buffer now in production are shown in the accompanying illustration. On the right is the light-weight buffer for diesel railcars and medium-weight wagons. This buffer, with an energy absorption of 400 in.

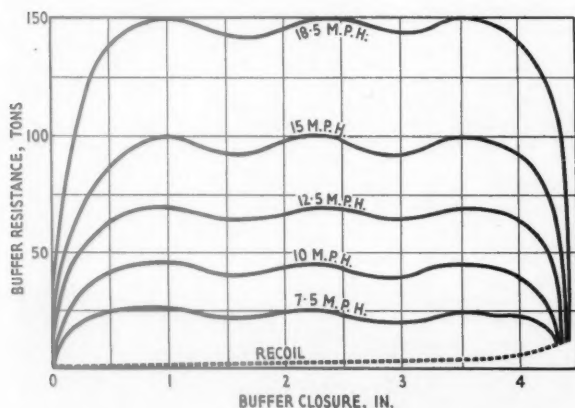


Fig. 1—Automatic variation of buffer resistance according to speed of impact

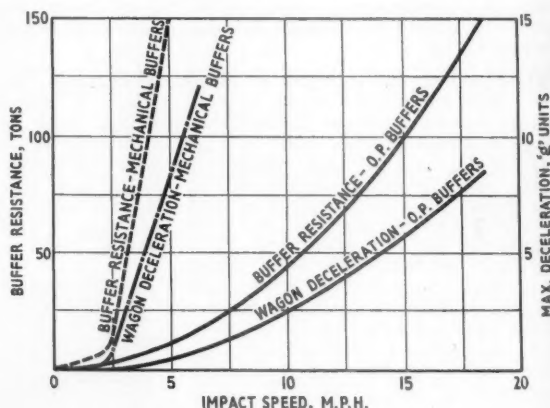


Fig. 2—Comparative tests of mechanical spring buffers and hydraulic buffers

in the piston; the impact energy is absorbed in heating the oil during its passage through the orifice. Projecting into the centre of the latter is a metering pin, which is tapered to reduce the orifice area during the stroke of the piston. By the correct proportioning of the taper the buffer energy absorption is made equal to the energy of impact at any speed and also provides a constant resistance throughout the stroke, though the speed of closure is dropping from half the impact speed to zero at the end of the stroke.

These characteristics are impossible to attain with a steel- or rubber-spring buffer, in which the energy is stored instead of dissipated. Buffer recoil is obtained by air pressure with hydraulic damping to control the speed. Sliding inside the buffer piston is an aluminium free-piston, which compresses the air in the air-chamber when oil is displaced

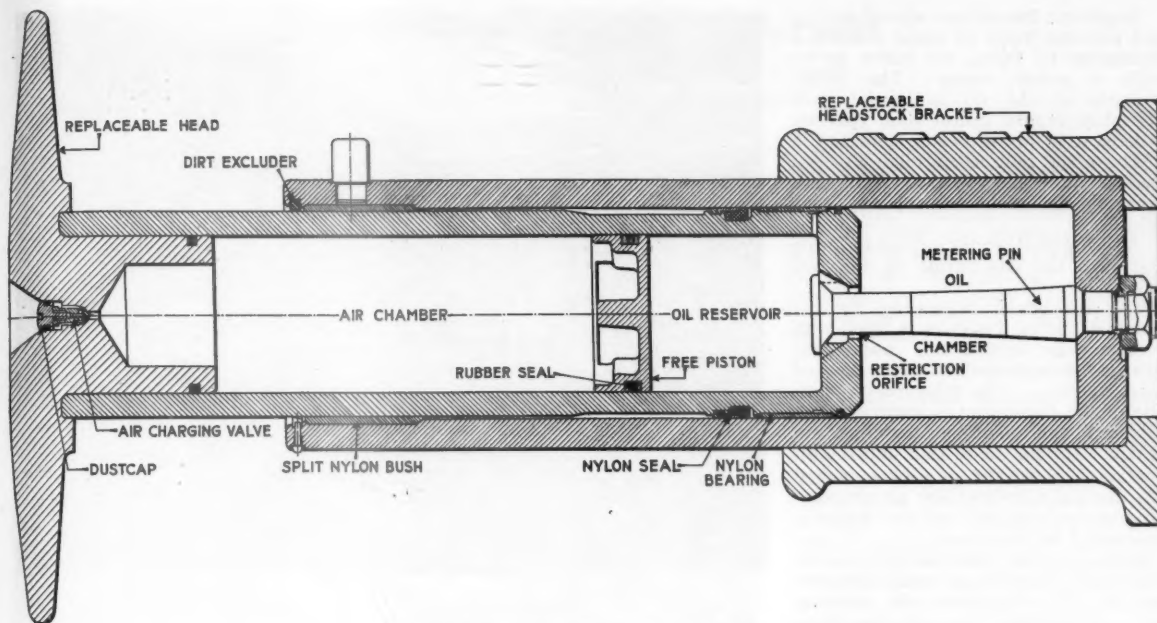
absorbed without a damaging peak resistance at the end of the stroke. Fig. 1 shows how the buffer resistance automatically varies according to the speed of impact. Fig. 2 shows comparative tests of mechanical spring buffers and the manufacturer's hydraulic buffers, illustrating that with the latter the impact shock is reduced by as much as 90 per cent. for a given shunting speed; alternatively, the speed for the same impact may be increased by over three times that possible with mechanical springs.

It has been found during a series of tests that maximum impact resistance efficiency should vary according to the class of wagon. In the case of mineral and tank wagons, maximum buffer efficiency is required for the full laden condition. For other freight stock a greater measure of protection is given at part-laden conditions. In the Oleo

ton, was tested by British Railways in 1952-53 and adopted as standard equipment for diesel railcars in 1954. The complete unit, made in aluminium alloy, weighs some 60 lb. and is designed for a maximum impact load of 100 tons.

On the left is a lightweight all-steel unit of 450-in.-ton capacity and a maximum impact load of 100 tons. This buffer carries a head which is turned and drilled for the attachment of the customer's buffer plate. The cylinder is turned for attachment of the customers headstock bracket. This latter feature permits the use of riveted or welded brackets with pinch-bolt clamping of the buffer.

In the centre is shown the all-steel heavy duty model now in large-scale production. Weighing 196 lb. this unit has an energy absorption of 600 in.-ton and an impact capacity of 150 tons. The sectional illustration and the



Sectional arrangement of heavy-duty buffer

following detailed description refer to this model. The basic features, such as internal reservoir, nylon bearings, and air-pressure recoil, however, are common throughout the range.

The buffer piston is a steel cylinder made by a cold extrusion process developed for the manufacture of shell cases. This is claimed to be an ideal process for the production of this component, as the extrusion is produced to a very close tolerance, and the elimination of machining results in a substantial saving in material. The hard skin produced by the dies only requires honing to produce a mirror finish. The buffer head is fitted in the open end of the piston. This carries a spigot which is a 10-ton press fit in the bore of the piston. The inside of the spigot is

bored out to reduce weight and to provide extra air volume. As an additional precaution against leakage from the air chamber a rubber sealing ring is fitted in a groove in the spigot.

The buffer head is a carbon steel forging. The conical-seated air-charging valve is fitted into a recess in the centre of the forging. The dust cap fitted in the valve is provided with a rubber seal to prevent water or dirt passing into the valve recess and also to provide a double seal against air leakage. To prevent distortion under repeated side loading of the buffer head, the piston is anchored and fully supported in a recess in the back of the head, the flange of this recess forming the compression limit stop.

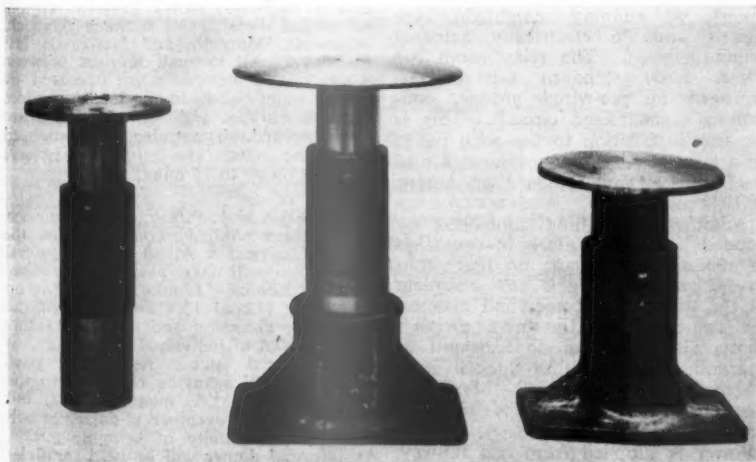
The use of a two-piece construction

for buffer head and piston permits easy replacement of damaged or worn heads and also facilitates the assembly of alternative sizes during manufacture. The piston operates in a steel cylinder, the end of which is formed integral with the shell. The blanks are produced in a horizontal hot extrusion press. This cylinder is a 10-ton press-fit in the headstock bracket. A rigid anchorage is provided by extending the spigot length beyond the oil chamber. This reinforcement of the cylinder in the section required to withstand impact pressures permits the use of a relatively light wall thickness throughout, with a consequent saving in weight.

To ensure that the correct interference fit is maintained on assembly of both buffer head in piston and cylinder bracket, the press is fitted with an electronic device which automatically stops the press if the fit is below standard. The piston is guided in two nylon bearing sleeves, the outer bearing being carried in a recess in the cylinder and the inner bearing in a groove in the piston. A spring-steel scraper ring acts as a dirt excluder for the outer bearing, the sliding surface of the piston being chrome-plated and polished.

Air and Oil Sealing

A major problem in hydraulic buffers is the provision of a satisfactory seal and a durable surface in the cylinder. After considerable development and field service testing, this problem was solved in the Oleo Pneumatic buffer by the use of a specially-shaped nylon lipped seal expanded against the cylinder bore by a rubber ring. This operates against a polished 10-micro.-in. hard chrome-plated surface.



The three Oleo Pneumatic buffer models in current production

To protect this surface against scoring and pick-up, metal to metal contact is eliminated by fitting the buffer piston with a nylon sleeve. The initial pressure of the oil is taken on a phosphor bronze piston ring, pressure leakage past the ring being collected in a groove and returned through a drilled passage into the oil reservoir, thus relieving the main seal of any high pressure.

A spring-steel circlip is fitted to locate and take the end thrust of the seal unit.

The free-piston separating the air chamber and oil reservoir is fitted with a rectangular section soft rubber seal supported on either side with a ring of hard rubber. The pressure on each side of the free-piston is approximately balanced and there is therefore no tendency for the air to leak into the oil reservoir. When the air valve is locked and the dust cap fitted, the air chamber is permanently sealed until the buffer is dismantled for overhaul.

Sealing of the metering pin in the cylinder is effected by a conical shoulder and an "O" ring under the securing nut. It is claimed that with the above sealing arrangements no provision for topping up of fluid in operational service is required, and that if the leakage were to exceed the reservoir capacity, the buffer should be removed for examination and refilling at a depot or works.



The slow-moving conveyor from assembly to despatch allows for paint drying and leakage testing

Field inspection is confined to visual examination for mechanical damage, wear of buffer head, and the length of buffer spindle exposed. If the buffer extends to its full working length when the couplings are released the unit is in

proper working order. Should the buffer not extend to its full length this indicates that topping up of fluid is required and the buffer should be removed and replaced by a reconditioned unit.

Power Signalling Installation at Naples

(Concluded from page 451)

notice, where all shunt movements are fully signalled, with complete sectional releasing.

Features of Signalbox

The push-buttons are mounted on consoles, or desks, with a large illuminated diagram at a higher level. This arrangement is now preferred in some countries to systems in which the buttons are on the diagram itself. As a rule, a route can be set and the movement over it signalled by pressing a single button, but occasionally two are involved. There is no re-setting to normal after a movement with such equipment.

In accordance with Italian operating practice ordinary train movements are dealt with by a principal signalman, or supervisor, from an independent console flanked by telephone and other communicating apparatus.

All shunt movements are directed by the ordinary signalmen at the main one below the track diagram, as seen in the illustrations. On this latter are the switches for individual operation of points, if required, while those governing cancellation of a train, or serving other emergency purposes, are placed on the supervisor's console.

The diagram is normally dark, with routes lighted in white when set and

locked and in red when occupied. Movements to and from Gianturco station can be left to work automatically, with an over-riding control from Piazza Garibaldi, relieving the Central box of all concern with purely local traffic.

Equipment

There are 531 route buttons controlling, singly or in combination, 650 running and some 3,200 shunting routes, 175 track sections, fed by 50 cycle current, 180 points and derailleurs, 60 running searchlight type signals and 76 electrically actuated ground signals. The relay room has about 5,500 standard type relays, arranged in pre-wired groups, controlling standardised circuits. This is the first installation to use such relays on a large scale. Point machines are to the State Railways standardised designs of 1942 and 1946.

Automatic signalling controlled by "coded" track circuits is in operation on the approach lines; on that from Aversa such working is now complete all the way from Rome, and also on the route from Gianturco through Piazza Garibaldi and underground to Pozzuoli. On the other lines it ends at the Poggioreale and Marittima junctions, where it connects with the interlocking block.

Power is supplied from one railway and one private source with diesel-electric standby, supplemented by four

sets of accumulators of varying voltage and capacity, charged through rectifiers. A saving of 84 operating staff has been effected, against which must be set an increase in technical of 29. A total annual saving of 25,208,000 lire is to be expected, with such others, very difficult to estimate, arising from elimination of delays and so on.

NEW DIESEL SERVICE IN N.E. ENGLAND.—British Railways, North Eastern Region, introduced diesel trains between Alnwick, Alnmouth, Morpeth, and Newcastle last Monday. All through services between Alnwick and Newcastle are operated by diesel trains and some local services between Alnwick and Alnmouth also are diesel worked. The trains are composed of two-car units. The journey times have been cut by up to 15 min.

THIRD B.E.A.M.A. PUBLICITY CONFERENCE.

—The third publicity conference of the British Electrical & Allied Manufacturers' Association will take place at the Connaught Rooms, London, W.C.2, on November 11 and 12. The name of the conference chairman and of the speakers and chairmen of individual sessions are to be announced later. As in the past, attendance will again be restricted to the staffs of B.E.A.M.A. member firms, but at luncheon on November 12 delegates will have the opportunity of bringing guests. An informal dinner will be held for delegates at the Connaught Rooms in the evening of November 11.

New Station at Gatwick Airport

Concentration of railway passenger and parcels facilities in the air terminal building



Gatwick Airport Station under construction, showing, in the background, the airport terminal building and framework of footbridge connection

A NEW station on the London-Brighton main line of the Southern Region of British Railways, built partially on the foundations of the old Gatwick Racecourse Station, is nearing completion. It is being built in close connection with the development of Gatwick Airport, and when opened on May 28, will supersede the existing Gatwick Airport Station.

The new station will be able to deal with 12-car trains at all three pairs of island platforms, but with few exceptions the trains serving the airport will be handled on the western island platform (Nos. 1 and 2) serving the up local and reversible lines.

A feature in the layout of the station

is the close association between the airport and railway facilities. The railway ticket and information offices are at first floor level in the main concourse of the air terminal building, which straddles the diverted London-Brighton road. Access to the station platforms is gained from an overbridge which leads from the terminal building and extends over all platforms. A parcels office incorporating an elevated double-roller shuttered loading bay, a store, staff mess room, lavatories and cycle store is situated underneath the main concourse in the station forecourt. A lift connects this parcels office with the first floor of the building, and all platforms by lifts at the south side of the overbridge which

is divided throughout its length to provide separate ways for passengers and parcels.

The ticket and information offices on the first floor are glass-fronted, and conform architecturally with the remainder of the building. Bellmatic ticket equipment, capable of housing 670 separate issues, will be installed in the ticket office.

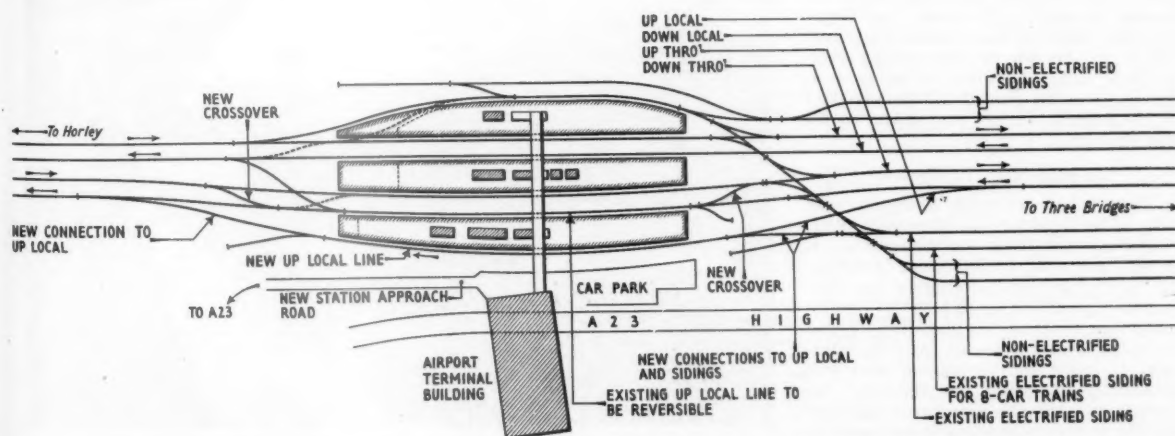
Station Construction

The old station platforms have been extended for some 100 ft. at the north end, and raised by 1 ft. overall. The main island platform (Nos. 1 and 2) was extra long to handle special racecourse trains, and this has been reduced in length from the south end. A staff block is situated towards the north end of this platform, and comprises station-master's office, staff mess room, and foreman's office. There are also general and ladies' waiting rooms, ladies' and men's lavatories, and a bookstall located between the staff block and the staircase. The general waiting room, as in all public rooms, will be fitted with fixed seating, and will have two G.P.O. telephone boxes installed.

All the buildings are of brick construction, with interior walls tiled. Central heating throughout the station is piped through from the airport terminal building. Glazed canopies are provided on all three island platforms, supported on welded steel columns of box construction. Fluorescent lights along the length of each platform will incorporate the station name in the outer cover.

Footbridge

The footbridge leading to the airport terminal building is supported on steel box columns. The main spans are steel girders, and the portal effect roof framework, which is supported on the main



Plan of the new Gatwick Airport Station showing alterations to layout to provide new up local and reversible lines



Airport terminal building showing footbridge to station and lift shaft serving platforms 1 and 2

trusses, is of lightweight Castella steel beam.

The decking is made up of pre-cast reinforced concrete units, and the roof is clad with aluminium sheeting with a waterproof coating. The side cladding is fastened to timber studding which is fixed to the steel members. The exterior face is vitreous enamel bonded to Asbestoslux, and the interior face is painted Durasteel. The footbridge is divided down its length by a glazed partition providing separate gangways for goods, connecting with the lifts, and for passengers connecting with the stairways. On the main airport platform provision has been made for an escalator to be installed at a later date if the volume of airport traffic should warrant installation.

Platforms 3 and 4 form the centre island serving the down local and up through line trains. They will be provided with waiting rooms and lavatories. The eastern island platform serves the down through and down loop lines; because only an occasional train will call there only one general waiting room without toilet facilities is being provided. Electric clocks will be installed in the general waiting rooms and on all the platforms.

Loudspeaker Equipment

The station is to be equipped with plug-in loudspeaker facilities with overriding control from the signalbox. It is also intended to introduce a system of recorded announcements on the western platform operated by push-button panels from the platform. These recorded announcements will be bilingual to assist the foreigners who will eventually be using the station. An illuminated departure indicator operated by the ticket collector will be installed over the entrance to the footbridge facing the main concourse, and illumin-

ated indicators will be installed on the platforms to show the principal calling points of each train.

Track and Signalling Alterations

The scheme for the new station has involved major track and signalling alterations including the provision of a new up local loop line and the conversion of the existing up local into a reversible line on which the new half-hourly train service will be based. The down service from Victoria will run from the down local into the reversible line, detach two or more carriages, and the front portion proceed to Bognor Regis via Crawley, Horsham, and Littlehampton, leaving the rear portion

in the platform. The next Bognor Regis up train will then run up to the reversible line on to the stationary portion and proceed to Victoria.

Associated Works

Associated with the scheme is the lengthening of the platforms at Purley, Coulsdon South, Merstham, and Redhill and the provision of additional berthing facilities for electric stock at New Cross Gate, Three Bridges, and Horsham. Track and signalling alterations between Gloucester Road Junction and South Croydon to convert the down relief line between Windmill Bridge Junction and South Croydon into a reversible line will be completed at the same time.

Passenger traffic at the new station will not be confined to those travelling by air. Besides staff employed at the airport the station will handle an appreciable volume of season ticket holders resident in the vicinity and many employees of firms in Crawley New Town industrial estate. Many of the latter are at present conveyed from and to the old station by a fleet of London Transport buses, the schedules of which will be adjusted to serve the new station.

Air freight traffic conveyed by passenger train will be handled at the new parcels office, while that by goods train will be transported to and from the new goods yard at Crawley.

It is expected that the various outstanding works will be completed in time for the station to open on May 28, although the airport will not be officially opened until June 9.

The main contractor for the scheme is James Longley & Co. Ltd.; the architects are Yorke, Rosenberg, & Mardall; and the consulting engineers are Frederick S. Snow & Partners. The scheme is being carried out under the general direction of Mr. F. E. Campion, Chief Civil Engineer, Southern Region.



Centre island platform (left) and main airport platform (right) serving the reversible line

RAILWAY NEWS SECTION

PERSONAL

Mr. W. P. Allen, Manpower Adviser to the British Transport Commission, will retire on June 30. He will be succeeded by Mr. Alexander R. Dunbar, at present Assistant General Manager, North Eastern Region, British Railways.

Mr. A. A. Harrison, Chief Charges Officer, Commercial Department, British

Acting Assistant Goods Manager, and was confirmed in this appointment in 1947. In the following year he became Executive Officer (Road Transport) to the Railway Executive, remaining in this position until his appointment as Chief Co-ordination Officer in 1954. Mr. Harrison visited East Africa towards the end of 1954 to advise the East African Railways & Harbours Administration on the introduction of a collection and delivery service. He was

Statistics Section in 1929. In 1932 he was attached to the District Superintendents' Offices at Newcastle and Sunderland for special duties and, in 1933, returned to headquarters to take charge of the Shipping Section in the Chief General Manager's Office. From 1934 to 1939 he was Assistant District Goods Manager, Newcastle-upon-Tyne. In 1939 he was appointed Rates & Statistics Assistant to the Chief General Manager. In 1941 he



Mr. A. A. Harrison
Appointed Chief Freight Officer,
Traffic Department, B.T.C.



Mr. E. A. W. Dickson
Appointed Chief Passenger Officer,
Traffic Department, B.T.C.

Railways Central Staff, whose office has been merged with that of Chief Freight Officer, Traffic Department, began his railway career with the London & North Western Railway. In 1922 he joined the North Eastern Railway. After training as a Traffic Apprentice he was engaged in staff work in the Chief General Manager's Office of the L.N.E.R. at Kings Cross. In 1926 he was appointed Assistant to the District Manager of the Southern Area of the L.N.E.R. at Leeds, and was appointed to a similar position when the Southern and North Eastern area district offices at Leeds were combined in 1927. Having taken a special interest in cartage work, he was appointed Road Motor Superintendent for the North Eastern Area in 1933, becoming Cartage Manager in 1941. He was responsible for the development of a comprehensive railhead collection and delivery system in North East England and for the mechanisation of most of the cartage work in towns. In 1943 he went to the Southern Area of the L.N.E.R. as

appointed Chief Charges Officer of the British Railways Division of the B.T.C. in 1955 and, in that capacity, assisted in the promotion of the Railway Merchandise Charges Scheme as well as the development of the new charging arrangements. He was Chairman of the Yorkshire section of the Institute of Transport from 1941 to 1943, and a member of Council of that body from 1953 to 1956.

Mr. E. A. W. Dickson, Chief Passenger Officer, Commercial Department, British Railways Central Staff, who, as recorded in our March 21 issue, has been appointed Chief Passenger Officer, Traffic Department, B.T.C., was educated at Haileybury College and Gonville & Caius College, Cambridge, where he graduated with first class honours in Classics. He joined the L.N.E.R. as a traffic apprentice in 1926 and, after gaining experience in the Commercial, Operating and Locomotive Running Departments, entered the Chief General Manager's Office in the Rates &

was loaned to the Chairman of the Railway Executive Committee (Sir Ralph Wedgwood) for special statistical work and, in 1942, became Secretary of the L.N.E.R. Committee on Post-War Development. Mr. Dickson was appointed Assistant Secretary of the L.N.E.R. Company on January 1, 1943, and on nationalisation became Treasurer-Assistant to the Chief Financial Officer, Railway Executive. In 1954 he was appointed Assistant Director of Funds, B.T.C. and, in 1955, Chief Passenger Officer in the Chief Commercial Officer's Department, B.R. Central Staff. Mr. Dickson is a member of the Institute of Transport, an honorary auditor of the International Railway Congress Association and a member of the Transport Panel of the Transport Tribunal.

Mr. H. N. G. Allen, Managing Director of W. H. Allen & Sons Ltd., Bedford, has become a member of the Research Advisory Council, British Transport Commission.

Mr. H. F. Pallant, M.Inst.T., Freight Officer, Commercial Department, British Railways Central Staff, B.T.C., who, as recorded in our March 21 issue, has been appointed Chief Operating Officer, Traffic Department, will also be responsible for operating and motive power. Mr. Pallant joined the service of the Great Eastern Railway in 1916. After gaining station experience, he became a Traffic Apprentice in 1925. On completion of his training in 1929, he was appointed Assistant Yardmaster at Bradford, and occupied similar positions at Whitmoor

Brigadier C. A. Langley, C.B.E., M.C., who, as recorded in our April 11 issue, succeeds the late Lt.-Colonel G. R. S. Wilson as Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, is 60. He was educated at Cheltenham College and at the Royal Military Academy, Woolwich. He was commissioned in the Royal Engineers in 1915 and served in France from 1916 in a Field Company, R.E., later becoming Adjutant to the Divisional Engineers. He was awarded the M.C. and Bar and was mentioned in despatches three times. After

newly-formed South East Asia Command. In 1945 he became Commandant, Transportation Training Centre, Longmoor. He was made a C.B.E. for his war services and was again mentioned in despatches. Brigadier Langley was appointed an Inspecting Officer, on his retirement from the Army, in 1946. In 1954, in the company of the late Lt.-Colonel Wilson, he studied modern methods of electrification on the French National Railways. In 1957 he acted as Assessor to the Commission of Inquiry into the serious accident which had recently taken place in Jamaica.



Mr. H. F. Pallant
Appointed Chief Operating Officer
Traffic Department, B.T.C.



Brigadier C. A. Langley
Appointed Chief Inspecting Officer of Railways,
Ministry of Transport & Civil Aviation

and Spitalfields, before moving to Liverpool Street as Assistant Stationmaster in 1932. Between 1935 and 1939 Mr. Pallant successively became Assistant to the Superintendent, Southern Area (Eastern Section), L.N.E.R.; Assistant District Superintendent, Edinburgh (Waverley), and General Assistant to the Superintendent, Southern Area, L.N.E.R. In January, 1940, he was appointed District Superintendent at Nottingham, L.N.E.R., moving in a similar capacity to York in 1943 and Hull in 1945. Mr. Pallant became Assistant Superintendent of the N.E. Area of the L.N.E.R. in 1946, Divisional Operating Superintendent, London Midland Region, Crewe, in 1953, and Freight Officer in the Chief Commercial Officer's Department, British Railways Central Staff in 1955.

Capt. St. John Cronyn, Hon. Secretary of the Transportation Club, 44, Wilton Crescent, London, S.W.1, has been succeeded by Lt.-Colonel A. D. Mulligan.

the 1914-18 war, he received higher military engineer training, including one year at Cambridge University. He was posted to the Railway Training Centre at Longmoor from 1922 to 1927, during which time he was attached, for a year, to the Southern Railway for training. In 1927 he was seconded to the Great Indian Peninsular Railway, when he was employed largely in connection with the electrification of the Bombay-Poona main line. He returned to Longmoor in 1933 as Instructor, and later Chief Instructor, Military Railways. He wrote a number of military textbooks on transportation and initiated the design and development of military steel trestles and bridges. Early in the 1939-45 war, he was responsible for transportation developments in the Middle East. He was later posted to India, where he formed a Transportation Training Centre for Docks & Inland Water Transport Troops, Indian Engineers. In 1943 he became Deputy Quartermaster General (Movements & Transportation) to the

The British Transport Commission announces the following appointments:—
General Staff of the Commission

Mr. C. J. Doyle as Instructor, Work Study Training Centre, Watford, Manpower Adviser's Department, Work Study Division.

Mr. S. J. Birch, Assistant Director of Accounts, Accounts & Statistics Division, as Assistant Railway Accountant, Finance Department, Railway Accounts Division.
British Railways Central Staff.

Mr. W. J. Hills, Executive Engineer's Department, London Transport Executive, as Telecommunications Assistant, Signal Engineering Department.

Mr. Kripal Singh has been appointed General Manager of the Eastern Railway of India.

We regret to record the death of Mr. Eduardo Hamilton, General Manager, Jamaica Government Railway. He has been succeeded by Colonel R. G. Jackson.

We regret to record the death of Mr. W. McAuley Gracie, Assistant Goods Manager, Southern Area, L.N.E.R., from 1927 to 1947.

We regret to record the death, on March 27, at the age of 65, of Mr. W. G. A. Cook, Mechanical Superintending Engineer, Colombo Port Commission, from 1951 to 1954. After serving an apprenticeship at Swindon Works, Great Western Railway, he joined the Ceylon Government Railway in 1922. In 1948, he was appointed Deputy Mechanical Engineer of that system, and became Acting Chief Mechanical Engineer in 1950.

British Road Services announces that on and from April 20, 1958, the existing Southern Scotland District will be reformed into two districts. The Edinburgh District will consist of the present Edinburgh Branch, and the Glasgow District will consist of the remainder of the existing Southern Scotland District. Mr. J. Kirkland, now Southern Scotland District Manager, will be Glasgow District Manager, and Mr. L. S. Jack, now Edinburgh Branch Manager, will become Edinburgh District Manager.

We regret to record the death, on April 3, at the age of 69, of Mr. William W. Whitney, formerly of the East Indian Railway.

Mr. D. W. Gilmore has been appointed Assistant Secretary, Canadian National Railways.

Mr. S. K. Guha, Deputy General Manager (Works), Gorakhpur, North Eastern Railway of India, has been appointed Director of Statistics, Ministry of Railways (Railway Board), New Delhi.

The following appointments have been made on the Argentine State Railways:—
General Roca Railway

Sr. Diego Arbasini as Chief Accountant.
Eng. Hortensio H. Villaseca to be Chief, Mechanical Department.

General Mitre Railway
Eng. I. N. Cusau to be Chief, Way & Works Department.

Mr. C. H. Mottier, Vice-President, Engineering, Illinois Central Railroad, is retiring after 47 years' service with that system.

Mr. J. M. Trissal has been elected Vice-President & Chief Engineer of the Illinois Central Railroad.

Mr. Sydney White has been appointed Technical Director, and Mr. G. K. Johnston, a Commercial Director of Cravens Limited. Both have been elected to the board of that company.

Mr. W. J. Weston has been appointed Birmingham Area Manager of Lancashire Dynamo Group Sales Limited, with effect from April 1, 1958.

Mr. D. A. C. Bennett, Overseas Sales Manager of the Dunlop Rubber Co. Ltd., has been appointed to the local board of Fort Dunlop, Birmingham.

Mr. E. R. Ball has been appointed Managing Director of the British Electric Transformer Co. Ltd. from March 18.

Mr. L. H. E. Jones, Export Sales Manager of Expandite Limited, is making a world sales tour.

THE LATE SIR JAMES MILNE

The following were among those who attended the Memorial Service held on April 15 at St. James' Church, Sussex Gardens, Paddington for the late Sir James Milne, former General Manager of the Great Western Railway:—

British Transport Commission

Sir John Benstead, the Rt. Hon. Lord Rusholme, Messrs. S. B. Taylor, Roger Chitty, Dr. F. F. C. Curtis, Messrs. C. E. R. Sherrington, J. L. Webster, J. W. Read.

London Transport Executive

Sir John Elliot, Mr. P. G. James.

Western Area Board

Messrs. R. F. Hanks, A. H. Curtis Welch.

Western Region

Mr. K. W. C. Grand and Mrs. Grand, Messrs. H. G. Bowles (also representing Mr. A. W. Tait), A. C. B. Pickford, W. G. Roberts, W. R. Stevens, J. W. J. Webb, S. G. Ward, Dr. B. M. Watney (representing Dr. C. T. Newnham), R. A. Smeddle, M. G. R. Smith, E. C. Cookson, A. W. Woodbridge, R. G. Henbest (also representing Mr. H. A. Short), A. W. J. Dymond, J. D. Swain (also representing Mr. F. R. E. Davis, former Secretary, Great Western Railway Company), C. W. Powell, L. W. Ibbotson, C. F. E. Harvey (also representing Lt.-Col. F. H. Harvey), C. J. Rider, C. T. Rogers, M. G. R. Smith, H. E. A. White, J. F. M. Taylor, S. Gray, I. G. Carson, H. Savage, P. S. A. Berridge, G. D. S. Alley, G. E. R. Penney, S. C. Harvey, N. S. Taylor, L. Doughty, P. Peyman, Miss E. G. Keane.

London Midland Region

Mr. David Blee.

Southern Region

Mr. C. P. Hopkins.

Eastern Region

Mr. S. G. Hearn.

British Transport Docks Division

Sir Robert Letch.

British Road Services

Major-General G. N. Russell, Mr. E. G. Marsden.

B.T.C. Hotels & Catering Services

Mr. S. Sweeney.

Tilling Group

Mr. C. H. S. Pickett.

Also present

Lord Hurcomb, Sir Charles Hambro, the Hon. Sir Edward Cadogan, Mr. W. Codrington (also representing Nyasaland Railways), the Hon. A. W. Baldwin, Mr. H. H. Phillips, Sir Eustace Missenden, Sir Michael Barrington-Ward, Sir Charles H. Newton, Sir Allan Quartermaine, Messrs. C. R. Dashwood, F. C. Hockridge, Mr. and Mrs. Gilbert Matthews, Messrs. C. Furber, H. H. Swift, H. E. Hedges, R. Burgoyne, G. E. Orton, Brigadier C. A. Langley, Sir Leslie and Lady Ford, Lady Lynden Macassey (also representing Sir Lynden Macassey), Lord and Lady Teynham, Sir Edward Wilshaw, Lady Oliphant, the Hon. Victor Spencer, the Hon. R. G. Lyttelton (representing Guest, Keen & Nettlefolds), Sir Leighton Seager, Bart., Sir Archibald J. Boyd, Messrs. G. Maclain, F. R. Hooker, K. D. Jackson, A. Charles Grant, L. M. Emery, T. Price (the last three representing Evan, Thomas Radcliffe & Co., Cardiff), B. W. C. Cooke, A. Dickson Wright, Mr. and Mrs. C. A. G. McLagan, Messrs. Stanley Adams, J. A. Warren-King, W. T. James (also representing Mr. J. Spencer Wills), E. W. Berry, C. W. E. Arbuthnot (also representing the Old Campbellians), Miss M. G. Milne, Messrs. George Henderson, Harvey Douglas, Mrs. Norman Harland, Messrs. G. I. Phillips, G. W. Hilyard J. Drummond, A. Powell (representing Wyman & Sons Limited), Norman Lettis, A. Endicott, Cecil Garstang, D. H. Grand, E. Huskisson, R. A. Smyrk, F. H. Layton, Colonel R. B. Readhead, Messrs. T. J. Lynch, N. H. Foster, R. H. J. Thomas, F. V. Lloyd, Andre Widhoff, R. Margot-Noblemaire, P. L'Hermite, R. P.

Beddow, W. P. Keith, Captain R. S. Nutting, Messrs. Alexander Belch, R. Goodison (also representing the Minister of Transport & Civil Aviation), Charles Bestock, G. V. Tossell, R. D. Bacon, E. L. Shepherd, G. Morton, Charles Holt, C. R. Wheeler, Mr. and Mrs. John Wilson, Messrs. W. J. Thomas, Stanley Smith, P. H. Pearson, W. N. Pellow, H. J. Peacock, F. W. Hawksworth, R. C. Y. Kirkpatrick, J. W. Enser, C. A. Lensen, S. G. Rowe, H. H. Starr, J. F. C. Cole, M. A. Pountney (representing Wyman & Sons Limited), Ian Napier.

Among those unable to be present were:—

Sir William Stanier, Lord Piercy, Lord Strathallmond, Sir Harold Hartley, Major-General Gilbert Szlumper, Mr. John Pole, and Mr. A. J. Turner.

The Rev. George Chappell officiated and Sir Charles Hambro read the lesson.

INSTITUTION OF CIVIL ENGINEERS

The Institution of Civil Engineers announces the following transfers:—

Associate Member to Member

Mr. W. F. Beatty, M.B.E., District Engineer, Crewe, London Midland Region, British Railways.

Graduate to Associate Member

Mr. R. J. Nicholl, District Engineer (Western), Nigerian Railway Corporation.

Student to Graduate

Mr. A. M. Hawkins, Chief Engineer's Office, Rhodesia Railways.

THE INSTITUTION OF LOCOMOTIVE ENGINEERS

The following names have been entered or transferred in the Register of Members of the Institution of Locomotive Engineers:—

Members

Mr. J. Dearden, Assistant Superintendent, Metallurgy Division, Research Department, Derby, British Railways.

Mr. G. G. Kibblewhite, Assistant (Rolling Stock), Chief Electrical Engineer's Department, British Transport Commission, British Railways.

Mr. P. H. Von Mitterwallner, Director, Krauss-Maffei A.G., Germany.

Associate Members

Mr. E. W. Birchler, Technical Assistant, Office of Chief Electrical Engineer, British Transport Commission.

Mr. J. F. Sadler, Assistant Engineer (Mechanical), Crown Agents for Oversea Governments & Administrations.

Mr. D. A. T. Sullivan, Mechanical Inspector (Diesel), Swindon, Western Region, British Railways.

Associates

Mr. J. J. Veale, Engineer, Caltex Africa, Limited, Johannesburg.

Mr. W. H. Wilson, Technical Sales Representative, W. M. Still & Sons, Limited.

Graduates

Mr. N. H. Bradshaw, Experimental Draughtsman, Derby, British Railways.

Mr. J. M. Braithwaite, Draughtsman, Derby, British Railways.

Mr. V. Parker, Draughtsman, Derby, British Railways.

Students

Mr. D. C. Blake, Apprentice Engineer, Stratford, British Railways.

Transfer Associate Member to Member
Mr. E. S. Cross, Works Manager, Ghana Railways.

Mr. C. H. Swan, District Motive Power Superintendent, Hull, British Railways.

Transfer Graduate to Associate Member
Mr. D. R. Sastri, Production Engineer, Integral Coach Factory, Madras, India.

NEW EQUIPMENT AND PROCESSES



Hydraulic Hand Pump

A COMPACT hydraulic hand pump, designed for operating a wide variety of hydraulic equipment, is now available. Known as the HP5, this pump is stated to be a robust and easily maintained unit which will give a long life of trouble-free service. The general appearance of the unit can be seen in the accompanying illustration.

Two hardened steel pistons operating in cast-iron cylinders create pressure at each stroke of the handle. The unit incorporates a relief valve, normally set at 2,500 lb. per sq. in. and a manually operable pressure release valve. The pump displacement per double stroke of the handle is 0.82 cu. in. The reservoir capacity is 6 pt.

A special feature of the HP5 pump, which considerably facilitates maintenance, is that the pistons have no rubber seals. The pump handle is adjustable to

any one of four positions: the unit lending itself to adaptation for a variety of applications.

Further details of the HP5 hydraulic handpump may be obtained from the manufacturer, Dowty Hydraulic Units Limited, Cheltenham, Glos.

Boiler Feed Water Treatment

AN arrangement has been made to develop, in the United Kingdom, the use of Zerex, a 35 per cent hydrazine solution for the de-oxygenation of boiler feed water.

Although there is no experience in this country in the use of hydrazine for the prevention of corrosion in locomotive boilers, it is stated that there appears to be no technical reason why it should not be so used. Economic considerations would probably be a deciding factor.

Deliveries of Zerex and technical advice on its use are available from Whiffen & Sons Ltd., Fison House, 95, Wigmore Street, London, W.1, or from Alfloc Water Treatment Service, in the latter case via I.C.I. Sales Offices.

Mobile Compressor Plant

A TWO-TOOL version of the Power Vane oil-flooded rotary compressor, model 120-RO-2, is powered by a 592E Ford diesel engine.

The Ford 592E four-cylinder diesel develops 45 b.h.p. at 1,730 r.p.m. Cylinder dia. is 3.937 in. and stroke is 4.520 in., giving a swept volume of 220.35 cu. in. The compression ratio is 16:1. As on other compressors of the same make, electric starting is provided as standard.

The compressor, a two-stage unit giving a 120 c.f.m. F.A.D. at 100 lb. per sq. in., is driven through a flexible friction drive and is fitted with an automatic, variable speed capacity control which varies the engine speed according to the demand for air.

The engine cooling water is cooled in a sectionalised tubular radiator, mounted behind the compressor oil cooler. A heavy

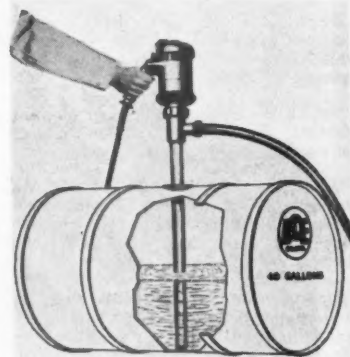
expanded metal grille guard protects the radiators from frontal damage, whilst engine temperature control can be achieved by adjusting the opening of the three-section folding doors in front of the guard.

Built-in locker compartments are provided for steels, hose, and so on, and the chassis is sprung-mounted on two pneumatic tyred wheels with parking and over-run brakes, thus making the plant suitable for high-speed towing.

Further details may be obtained from the manufacturer, Consolidated Pneumatic Tool Co. Ltd., 232, Dawes Road, London, S.W.6.

Portable Barrel Pump

A PORTABLE electric barrel pump, which can deal with more viscous liquids than previous designs, has been introduced. Applications to railways include, extracting fuel and lubricating oils,



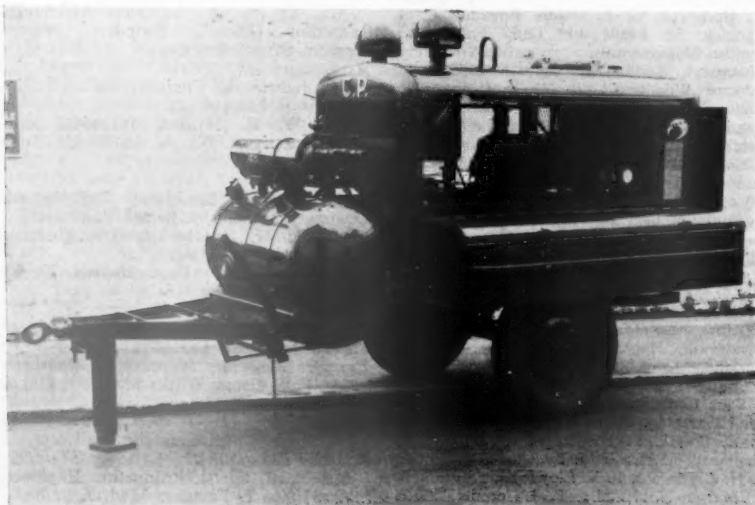
and paints from barrels, drums or carboys; emptying and refilling machine tool suds tanks and clearing soluble oil contaminated with fine abrasive material and sludge; and emptying, refilling and topping up transformers on sites where access is not possible for a tank lorry. The accompanying illustration shows the general design of the unit.

Among the features of the pump is an increase in the maximum motor loading to 400 W., and the addition of a cooling fan, which blows air over the motor casing whilst the pump is in operation. The lifting, and inner tube containing driving shaft, for all lengths and types is easily removed and is interchangeable. Thus, the same pump can be used for water, oils, and so on and acids or other corrosive liquids, as required, by changing the lifting and inner tube assembly.

The lifting tube is easily inserted into normal barrel entries, as the overall external dia. is 1½ in. It is reinforced at the lower end to withstand rough use. The pump, of the self-priming type, will operate against full pressure. That is, when in use with the quick action tap at the end of the hose closed, it will continue to function without overloading.

It can be dismantled for cleaning and sterilising the parts, which are in contact with the liquid. Power is transmitted through a 0.2 in. dia. driving shaft via a positive coupling.

If the pump becomes overloaded or over-



heated, beyond 60° F., by the liquid being pumped, a thermal overcurrent cut-out in the motor housing disconnects the supply until the pump cools.

The pump is made in two versions: type 400-N, with a 2-ft. 3-in. lifting tube, which is suitable for entry into a normal barrel with the entry on the side; and type 400-S, which has a stainless steel lifting tube. A full range of accessories is available. The net trade prices are £35 10s. and £58 10s. respectively, and delivery is from stock. The manufacturer is British Central Electrical Co. Ltd., 6 & 8, Rosebery Avenue, London, E.C.1.

Synthetic Foam for Seating

AS a result of research and development work in the United Kingdom and the U.S.A., a synthetic foam, claimed to be the most rubber-like so far developed, has been produced. It is mainly derived from polyether and other raw materials obtainable from the petroleum and coal tar industries and will be complementary to latex foam and existing synthetic foams.

It is expected that the product, which is now undergoing exhaustive tests at the manufacturer's works at Walton, Liverpool, will have many applications, particularly for upholstery.

One characteristic of importance to the transport and aircraft industries is that weight for weight it will support a greater load than latex foam. Its resistance to chemicals and to ageing and weathering are also likely to prove fundamentally superior.

Its physical properties are stated to represent a considerable advance over those of existing synthetic foams on account of the more chemically stable polyether component and the closer control that can be exercised in the early stages of manufacture.

The foam is being manufactured by the Dunlop Rubber Co. Ltd., St. James's House, St. James's Street, London, S.W.1, from which full details may be obtained.

Hydraulic Tractor-Mounted Power Grab

AN addition to the range of attachments for the Dinkum Digger Major trench excavator is the Whitlock hydraulic power grab. This is covered by a Provisional Patent No. 7818/58.

The power grab is of $\frac{1}{2}$ cu. yd. capacity, and has a wide range of uses. Not only will it load and unload such materials as coal, coke, sand, gravel, aggregates, over the side of a wagon or hopper exceeding 10 ft. in height and on to scaffolding, but it will also dig square-sided holes suitable for telegraph and electric light poles, concrete piers, and so on, to a depth of 9 ft.

It will also carry out mass excavation to a depth of 16 ft. and can be used for ditch cleaning and other clearance work.

The grab jaws are hydraulically opened and closed. When digging in difficult materials, great down-pressure can be exerted on the jaws whilst they are being closed.

The rate of slewing is high through an arc of 190 deg. The grab can be attached to any standard Dinkum Digger Major in a matter of minutes.

The equipment is being manufactured by Whitlock Bros. Ltd., Great Yeldham, Essex, from which company further details may be obtained.

Electric Furnace Heating Elements

CRUSILITE Type DS is a type of silicon carbide heating element in which the electrical connections are both at the same end. It is suitable for working at all element temperatures up to 1,575° C. and its form of construction is stated to enable a new approach to be made to many problems in the design of high temperature furnaces.

It is similar to previously-designed types T and X in that the one-piece construction, with its inherent advantages, is retained. But, whereas the latter have two cold ends and a central hot zone formed from a single spiral, a Type DS element has only one cold end and its hot zone is in the form of a two-start spiral. The cold end is split longitudinally to provide the leads through which the current can pass into and out of the hot zone, and the "double-spiral" enables the current to travel to the end of the hot zone and back again.

The overall length of Type DS elements comprises the length of the cold end, the hot zone length, and a short unspiralled length, approximately equal to the diameter, at the far end of the hot zone.

A special terminal assembly has been developed and each element is supplied complete with it. Applications are for both laboratory and production operations, the latter including continuous casting of non-ferrous metals and so on.

It is available in three diameters: 18 mm., 22 mm., and 28 mm.; maximum hot zone lengths are 250 mm., 300 mm., and 400 mm.; maximum overall lengths, 450 mm., 650 mm., and 750 mm.; and resistance/100 mm. per hot zone, 2.75 ohms., 2 ohms., and 1.5 ohms., respectively.

Aluminium braid connectors are required additionally to connect up to the bus bars or terminal posts, and can be supplied to order.

It is intended for use in furnaces where conventional silicon carbide elements are difficult or impracticable to accommodate. If the electrical connections cannot conveniently be made on opposite sides of the furnace or if the furnace chamber is too large to be spanned with conventional

elements, Type DS should be then used.

In large kilns, Type DS elements can be mounted in the roof hanging vertically downwards and if convenient, on the walls pointing horizontally inwards. The dimensions of the furnace, thus, no longer impose a restriction on the method of heating. If Type DS elements are used no furnace can be too large for it to be heated by electricity.

Further details can be obtained from the manufacturer, the Morgan Crucible Co. Ltd., Battersea Church Road, London, S.W.11.

General Purpose Adhesive

AN adhesive with a very wide range of application has been developed with the trade name of Pitabond. The range of materials for which it can be used, sticking any of them to any of the others, includes cement, concrete, plaster, asbestos, glass, metals, wood, plastics, slates, tiles, building blocks and building boards, fabrics and linoleum.

The product is an emulsion which can be thinned only with water. It does not require heating or mixing and is harmless and non-inflammable.

Pitabond dries to a water-clear film. It is waterproof and resistant to petrol, oil, grease, moulds and fungi, weak alkalis and weak acids; it is non-staining, and does not become brittle with age.

It may be applied by brush, roller, spray-gun, soft broom, and so on. All surfaces to which it is to be applied should be clean and free of grease. Loose particles should be removed by brushing, and all dirt, oil and grease, must be removed.

Application conditions vary so widely that it is impossible to give precise coverage figures; the coverage will vary between 250 and 500 sq. ft. per gal., according to the porosity of the surface. Pitabond quickly becomes tacky, and will dry within an hour. The surface can be kept open by moistening with water.

It is supplied in 1-gal. cans and 5-gal. drums. The price is 63s. per gal. Pitabond is manufactured by Caulking Services Limited, 36, Great Queen Street, London, W.C.2.



Staff and Labour Matters**Railway Wages Dispute**

*Rejection by majority decision of Railway Staff
National Tribunal of claims by three railway unions*

The Railway Staff National Tribunal issued its decision, No. 21, on April 10, on the claims of the three railway trade unions, the N.U.R., the A.S.L.E.F., and the T.S.S.A., for improved rates of pay for salaried and conciliation staff employed on British Railways.

The members of the Tribunal were Sir John Forster, Q.C., Chairman; Mr. A. J. Espley, nominated by the British Transport Commission, and Mr. E. Hall, nominated by the unions.

Basis of Claims by Unions

The main arguments common to all the three trade unions, N.U.R., A.S.L.E.F., and T.S.S.A. which they advanced in support of their respective claims are summarised in the decision as follows:—(1) Railway wages and salaries are generally lower than those in comparable industries; and (2) the increase in the cost of living justifies a further improvement in railway wages and salaries.

The N.U.R. in support of its claim for a "substantial" increase in rates of pay contended also that: (1) railway wages and salaries have fallen further behind those of other industries; (2) it is no answer to the claim for the Commission to say it has not got the money; its financial difficulties have been caused by unreasonable statutory controls and Government intervention which the Commission has not opposed sufficiently vigorously; (3) it has not been established that a wage increase for railwaymen would be inflationary; and (4) the successful fulfilment of the modernisation plan depends principally on the co-operation it receives from their staff; it is entitled to expect that co-operation only if it pays reasonable and fair wages.

The A.S.L.E.F. in support of its claim for an increase of 10 per cent in the standard rates of pay of locomotive staff contended that: (1) the current rates of pay are inadequate recompense for the exceptional, highly skilled and responsible duties performed; and (2) the increase sought is necessary for the retention and future recruitment of the right type of staff to meet the requirements of the modernisation plan.

The T.S.S.A. contended that: (1) account should be taken of the rise in the retail price index since October, 1956; (2) it is necessary to improve railway salaries so as to attract, and retain, the right type of recruit; and (3) in view of the contribution made by the salaried staff to the increasing efficiency of the railway service, the real value of their salaries should be at least maintained.

Arguments Used by B.T.C.

The main arguments on behalf of the Commission are summarised in the decision as follows: (1) It has not been established that railway salaries and wages, or earnings, are too low compared with those in other industries, but on the contrary in the last three years they have been three times substantially improved and are no longer lagging behind; (2) apart from certain areas where special difficulties are experienced by all employers, because of the shortage of labour, British Railways are holding their own in the recruitment and retention of

staff; (3) the increase in the cost of living since the last settlement in March, 1957, is only 3.2 per cent; (4) an increase of pay at this time in an attempt to restore the purchasing power of the staff to the March, 1957, level would be largely self-defeating because it would inevitably give rise to a general round of wage increases causing a further rise in prices; (5) further additional staff costs would adversely affect the stability and development of the railways under the modernisation plan and would seriously impede the current efforts to increase business; the B.T.C. would be compelled to seek special means to meet these costs, including the curtailment of services, and these measures would adversely affect the future prospects of the Commission and the livelihood of railwaymen; and (6) an increase of railway salaries and wages at this juncture would destroy the prospect that prices may keep steady or fall if nothing is done to start another round of rising wages and prices.

Having summarised the arguments advanced by the parties to the issue the findings of the Tribunal are then published in the decision. These findings are in two parts: (1) a majority finding by the Chairman and Mr. A. J. Espley; and (2) a minority finding by Mr. E. Hall.

Finding by Chairman and Mr. Espley

The finding by the Chairman and Mr. A. J. Espley is in the following terms and does not recommend an increase of wages at the present time:—

"In September, 1956, the Commission prepared and submitted to the Minister of Transport & Civil Aviation a review of its policy and prospects with special reference to railways. This review was subsequently embodied in the Government White Paper on 'Proposals for Railways' (Cmd. 9880) which was presented to Parliament by the Minister in October, 1956.

"The review referred to, which dealt in Chapter II with the financial problem of the Commission, showed, *inter alia*, that in comparison with the years immediately preceding its issue there had been a financial shortfall in the working surplus during 1955 of a very considerable magnitude. This shortfall was due in the main to losses incurred during the railway strike, to the lapse of several months in putting up railway charges, and to the sudden increases in prices (chiefly coal) immediately after the process of re-adjusting charges had been completed, which losses together amounted to £27 million.

"At the same time the Commission pointed out that against any surpluses earned, central charges, mainly the charges for remuneration of capital, had averaged about £50 million a year, with a tendency to rise in later years, principally because of the need to replace assets booked at prewar values by assets purchased at the new levels of cost and that the exceedingly poor results of 1955 prompted the view that one could no longer expect the lean years to be safely recouped out of the better ones in the future, with the level of the accumulated deficit kept to negligible proportions in consequence. There was, it

was stated, growing indications as 1955 closed, that, although it was a year of financial unbalance, it was not a year of fundamental economic weakness. The review showed, however, that early in 1956 the position deteriorated further. With the general drive throughout the country to halt further increases in the price of basic goods and services it became doubtful whether the last general increase could, or should, be recouped forthwith in higher transport charges.

"On the railways in particular, the general merchandise traffic had continued to decline, partly because they were not equipped to improve their standards of service in step with their competitors and in the event it had been decided to limit the amount and nature of proposed increases in transport charges for six months and to use that period for making a review of the whole position. Allowing for the increases of charges which were authorised there was a gap in the Commission's budget of the order of £35 million a year—and since then there had been further increases in costs and other changes in the position which meant that the probable rate of deficit would be about £45 million a year.

B.T.C. Deficit

"At the end of 1955 the accumulated deficit was already £70 million. By the end of 1956, however, the accumulated deficit would, it was anticipated, be of the order of £120 million, assuming no further increases in wages or other costs. The Commission stressed the importance of realising what its position would be in a few years' time if appropriate measures were not taken to relieve it. The total deficit carried forward, it was pointed out, would reach unmanageable proportions and ultimately a default on the Commission's obligations would be inescapable, with serious effect on the services provided to the trader and to the travelling public.

"It was in the circumstances appearing in the Commission's review that, as shown in the White Paper, the Government proposed 'that for a specified number of years, broadly until the revenue account of the Commission was expected to be in balance, special advances should be made to the Commission out of the Consolidated Fund equal to their revenue deficits for the years 1956-62 inclusive but limited as to total amount which might be of the order of £250 million.'

"The effect of the Government proposals was to freeze for the time being the Commission's accumulated deficit, which at the end of 1955 stood at £70 million, and to permit of borrowing sums as required, but not exceeding a total of £250 million to meet deficits incurred between 1956 and 1962 inclusive, during which period the modernisation plan would be proceeding.

Transport (Railway Finances) Act, 1957

"It was to give effect to these proposals that the Transport (Railway Finances) Act, 1957 was passed. There is no provision in the said Act which limits the annual rate at which the Commission may borrow against £250 million made available to it. During 1956 the Commission had a deficit of £57.5 million on its railway undertaking,

while on its other activities there was a surplus of £3.1 million. To cover the net deficiency for 1956 the Commission borrowed £54.4 million roughly 1/5 of the maximum sum of £250 million made available to it.

"The year 1957, we were informed, was an unsatisfactory year for the railways. Expenses were considerably higher, mainly as a result of the increase of salaries and wages arising from the March settlement. Further; there was a tendency for freight traffic, on which profit margins are narrow, to fall, and even though the results of the year included the benefit of a non-recurrent windfall for the railways, due to additional traffic directed to rail as a result of the restrictions of liquid fuel during the Suez crisis, it was already clear that the deficit for 1957 would exceed the 1956 figure of 54.4 million. The borrowings against 1956 and 1957 deficits, which together must inevitably total a sum in excess of £110 million would seriously deplete the £250 million which had been calculated as necessary to cover the Commission's deficits for the period 1956-62 inclusive, of which there were five years still to run.

"The claims by the N.U.R. and the T.S.S.A. are for increases of unspecified amounts. The A.S.L.E.F. on the other hand has asked for an increase of 10 per cent for their members. Using this latter claim merely as a yardstick, an increase of this order applied to wagons grades covered by the claims generally would involve raising the wages bill of the Commission by some £30 million a year, and this without taking into account the cost of other applications made by the unions which, if granted, would, it is estimated by the Commission, add a further £17 million a year."

Competition for Traffic

"Competition on both the freight and passenger sides is proving 'fierce' and, in consequence, the advisability of again raising freight charges, which were last raised in August, 1957, or passenger fares, which were raised last September, was open to serious question. If, however, it were to be held practicable and commercially prudent to obtain additional receipts in 1958 from higher charges, these would be needed, we were informed, to keep the 1958 deficit within the maximum limit originally contemplated, at the present level of costs, and would not be available for meeting increased costs whether for wages or anything else.

"Increases in salaries and wages at the present time could, we were informed, only be met by drastic and damaging curtailment of the Commission's activities and services beyond those contemplated in its review and this, it was claimed, would be contrary to the interest of the railways, and the staff who served them, and contrary too, to the interest of the customers and of the country.

"The modernisation plan which is now being implemented is both bold in conception and comprehensive in application and is already producing a resurgence of the pride and interest which was an outstanding attribute of railway staff. It is felt that results which should flow from its implementation will develop a service of which the nation and the staff will be justifiably proud and the staff, as has been indicated to us by the Commission, should share in the benefit which may be expected to accrue from the plan both financially and in their conditions of service."

Railway Pay Low in Comparison

"The evidence before us shows that the basic rates of staff covered by the present

claims are low in comparison with those cited to us as applying in other nationalised industries, public services and certain private undertakings.

"It is impossible for us to forecast what may be the order of the annual deficits which will be incurred by the Commission this year and in the years up to 1962. But in the light of the circumstances outlined above and of the fact that to cover deficits incurred up to 1962 the Commission is, by statute, prevented from borrowing a sum in excess of £250 million; against which sum it has already been compelled, or will be compelled, to draw sums which together will exceed £110 million for 1956 and 1957, we feel ourselves unable to recommend an increase of wages at the present time."

Recommendations by Mr. Hall

Mr. E. Hall dissents from the majority report and recommends:—

(1) The immediate restoration of purchasing power of wages and salaries covered by this claim, to the same level that obtained following the 20th Award, dated March 19, 1957;

(2) The Tribunal having accepted that the basic wages are low in comparison to similar grades in other nationalised industries and public services, the contending parties should meet again in an endeavour to resolve this problem using the rates as submitted to the Tribunal as a basis for settlement.

In reaching this decision Mr. Hall states:—

"The evidence before the Tribunal was unanimously accepted as showing that the basic rates of staff covered by the present claims were low in comparison with those cited to us as applying in other nationalised industries, public services and certain private undertakings.

"It is not disputed by the Commission that there has been an increase in the cost of living. The only difference between the parties on this heading being on the question of amount. The Tribunal unanimously agrees that there has in fact been an increase in the cost of living as shown by the Index of Retail Prices since March 19, 1957, the date of its last award.

"In paragraph 11 on page 4 of the Government White Paper presented to the House in October, 1956, it was stated:—

"The setting up in 1955 of the British Railway Productivity Council was a recognition of all concerned that the successful operation of the Commission's undertaking and its prosperity are dependent in a high degree on the efficient and willing co-operation of every member of the staff. It is an important factor in any consideration of the Commission's position that two-thirds of their total expenditure is accounted for by wages and salaries."

"I cannot accept the view that the deficits incurred by the Commission in their attempts to modernise and subsequently reorganise the British Railways should be partially recouped through the worsening of the standard of living of the employees of this undertaking.

"I cannot accept that when under the Transport (Railway Finances) Act, 1957, the Government undertook to finance the Commission's deficits on its revenue account to the extent of a sum not exceeding £250 million during the seven years from 1956 to 1962 inclusive, it was intended that the said Act should be used as an instrument or reason to prevent the employees of the Commission from maintaining their then existing standard of living, nor can I accept the said Act as a reason for refusing to improve basic rates

to ensure their reasonable comparability with those payable to employees of similar grades in other nationalised industries or public services.

"It would be impossible to obtain the efficient and willing co-operation of any staff whose basic wages are admittedly low as against similar grades in other nationalised industries and/or public services, who could not rely upon an independent tribunal to restore their declining purchasing power.

"We were told by the Commission, as for the present, their ability to raise additional revenue by increasing fares and charges is restricted by purely commercial consideration. I do not hold that the terms of reference in this claim makes the Tribunal competent to say how the Commission should obtain the necessary finance to meet the claim."

N.U.R. and A.S.L.E.F. Reactions

The T.S.S.A. executive at a meeting on April 13 decided to reject the Tribunal decision and to urge for an early meeting with Sir Brian Robertson.

Leaders of the N.U.R. and A.S.L.E.F. expressed their concern and "disgust" at the Tribunal's majority report and the Executive of the A.S.L.E.F. has rejected the award. A joint meeting of the three Unions to discuss what action should be taken was held on April 14. It was decided to ask for a meeting with Sir Brian Robertson.

Statement by Sir Brian Robertson

The Chairman of the Commission, Sir Brian Robertson, issued the following statement on April 11:—

"When presenting their case before the Arbitration Tribunal the railway trade unions argued for an increase in wages partly to offset the rise in the cost of living, partly on the grounds that railway wages and salaries are generally lower than those in comparable industries. While contesting that a rise in wages for either of these reasons is justified at this time, the Commission's representatives said that in any case the Commission cannot afford to increase wages—at this time, and that is a fact, neither more nor less.

"The Tribunal has decided, by majority, to uphold the Commission's case. Understandably this has disappointed the unions, but I believe that their good sense will induce them to deal calmly with the situation created by this decision. So far as the Commission is concerned, no proposal to give a wage increase at this time in the face of this decision should be expected.

"On the other hand, I do not care for expressions such as 'the wages battle' which are being used in connection with this problem and that of the London busmen in which the Commission are also concerned."

Co-operation of Staff Essential

"It has been rightly said that the co-operation of the staff is essential to the success of the Commission's business. Since the wage improvements negotiated with the unions in 1946 and 1957, we have had from them a degree of co-operation which other industries might well envy. But we need their further co-operation in the immediate future and we are certainly not wanting any kind of a battle with them.

"The only battle in which the Commission is engaged is the battle for the future of British Railways. It is a battle which can be won and which if won will bring much greater rewards to British rail-

waymen than anything which is being claimed right now. It is a battle in which management and men are equally engaged, and are fighting and must fight on the same side if it is to be won. Increasing modernisation is the key to improvement in the position of the railwaymen. I do not mean that our staff must wait for any improvement till complete modernisation has been achieved, nor even until 1962. On the contrary, the sooner the better. I have deplored therefore that the pace of modernisation has been checked recently by the cut in our investment programme. I should like to be able to give the order 'full steam ahead' once more. I will lend my every effort to press for this and for any other measure by which the future of British Railways and of the British railwaymen might be better assured.

"I do most earnestly hope that the railway trade union leaders and those whom they represent will put this consideration above all others, and do nothing at this critical and difficult time to jeopardise the future."

"If they wish to see me, I shall be glad to see them."

Meeting between B.T.C. and Unions

The meeting was held on April 16. It was then agreed that a sub-committee should be set up to examine the matter and that this should meet in the afternoon of April 17.

A.S.L.E.F. Claim for 40-hr. Week

The Railway Staff National Tribunal, the constitution of which was the same as that for the pay claim, issued its decision, No. 22, on April 10, 1958, in connection with the claim of the A.S.L.E.F. for a 40-hr. week for railway locomotive staff.

The Tribunal awarded that after careful consideration of the evidence and submissions of the parties the claim had not been established.

The decision summarises the main arguments of the parties as follows:—

A.S.L.E.F.: (1) The intensification of railway working necessitates that footplate staff shall have an adequate rest period; (2) the exceptional circumstances surrounding the railway transport service justify the claim; (3) the staff are entitled to a shorter working week as a basic requirement in absorbing the large numbers of men who will be made redundant as a result of the modernisation plan; and (4) the staff are entitled to consideration in view of the greater productivity obtaining within the industry.

B.T.C.: (1) The present standard working week of 44 hours is fairly general in major industries, and there is no evidence to demonstrate that any undue strain or increased responsibility has been placed upon locomotive running staff; (2) a reduction of working hours could only be achieved at a cost of increased numbers of staff with a reduction of productivity per head; (3) it is unrealistic to endeavour to seek a shorter working week at a time when increased productivity within the present working week is the paramount need in the interests of all; (4) if the claim were conceded repercussions on other sections of railway staff would be unavoidable. The cost of meeting the claim would be no less than £3,800,000 a year; if applied also to other sections of railway staff it would result in an increased annual cost of £20,000,000; and (5) the effects of a shorter working week for locomotive running staff at the present time would in all probability defeat the objective of the modernisation plan and hinder the achievement of the aim of financial stability by 1962.

Bridge Reconstruction in the L.M. Region

*Additional overhead clearance for
25-kV. 50-cycle electrification*

To provide for the additional overhead clearance required by electric trains which are to go into service in September, 1960, on the first portion of the electrification of the London Midland Region between Crewe and Manchester, 88 bridges on the 31 mile stretch have to be altered or partly reconstructed. Of these, 28 have already been altered and work is now in progress on many of the remainder.

Safety Measure

The new electric services will require more room overhead because, for safety reasons, there must be an air gap between the high voltage catenary wires and the rolling stock and also between the wires and the bridge structure. At least 15 ft. 8 in. clear headroom above rail level is necessary and to achieve this clearances have had to be increased by 1 ft. 3 in. up to 2 ft.

Generally, overline bridges have to be raised, but in some cases it has been possible to increase the clearances by lowering the tracks. This method, however, cannot be widely employed because undue undulation of the track must be avoided and the tendency today is towards deeper ballasting to accommodate the high speed running planned for the new electric services. This has meant that some bridges under the line have to be reconstructed or fitted with decking suited to the carrying of ballasted track.

Overline Bridges

The greatest number of bridges requiring modification are overline bridges and many methods are adopted in reconstructing and altering them to give increased clearances. In the case of a typical three-arch bridge with tracks running through the centre span, it is often necessary to reconstruct this span at a higher level. The method adopted is for the side arches to be tied temporarily to prevent their collapse on

removal of the centre span. Demolition is usually carried out by first weakening the span and then dropping a crane-suspended weight on it. A steel framework is placed in position to support a new reinforced concrete arch during its construction. Thrust from the new arch is taken by the existing side arches. The steel supporting structure is then removed from the arch and the side arch tie-bars taken out.

An alternative method of arch reconstruction is for the existing span to be used to support the new reinforced concrete arch during construction. The old arch is subsequently removed. With certain girder bridges, the increased clearance is achieved by jacking up the entire superstructure with the bridge deck intact. Afterwards the bridge abutments are built up to the new height and the approaches re-formed to conform with the bridge.

Tunnels

To obtain the required overhead clearance at Stockport it will be necessary to open out the Edgeley Tunnels. This scheme has been complicated by the major road intersection which is located partly on top of the tunnels and it will be necessary for a wide bridge, large enough to carry a road roundabout, to be constructed at this point.

At Crewe, where a 10-span bridge carries the Nantwich Road over several tracks and platforms, complete reconstruction will be necessary to give the extra headroom required by electric trains. Problems confronting the engineers on this particular job are the cramped site conditions with the station immediately adjacent to the road, and the necessity to keep both road and rail traffic going while work is in progress. The reconstruction will be done on half the bridge at a time so that part of the road will remain open for road traffic and interference with trains minimised.



New reinforced concrete arch formed on the old arch of overline bridge at Holmes Chapel to give support during reconstruction

Questions in Parliament

Improvements to the Railways

Captain Pilkington (Poole—C.) asked the Minister of Transport & Civil Aviation on April 2 what financial outlay he had sanctioned for railway improvements this year.

Mr. Harold Watkinson: I would refer to the reply I gave on November 13 last: In 1958 the B.T.C. propose to invest in railways about £145 million, and in other activities about £25 million. It is not possible to distinguish between replacements and modernisation since most capital investment on the railways includes some modernisation.

Captain Pilkington: Is any further expenditure likely to result in an improvement in the punctuality of trains? There is a widespread feeling that the punctuality of the nationalised British Railways is very much worse than on the railways before the war when they were under private enterprise.

Mr. Watkinson: A very large order was recently placed for new British Deltic locomotives by British Railways. We must look in the acceleration of the modernisation plan for increased speeds and increased punctuality. It is, therefore, to modernisation that one must look for improvements, and not take too many glances at the past.

Progress of Modernisation Plan

Mr. Geoffrey Wilson (Truro—C.) asked the Minister of Transport & Civil Aviation on April 2 what progress has been made by British Railways with the capital modernisation plan.

Mr. Watkinson: The programme has got under way much more quickly than was originally forecast. Important matters of technical and commercial policy have been decided and a large part of the programme is now committed.

Mr. Wilson: Can my right hon. Friend say to what extent the programme is up to schedule or above schedule?

Mr. Watkinson: The programme is well ahead of schedule, but equally it is only fair to say that, in the next two years, cuts have been made in the level of expenditure that the railways would have liked, due mostly to the great acceleration which they have managed to put into the programme. I think the fair answer to my hon. Friend's question is that the programme is well ahead, but it is not quite so far ahead as it would have been if I had allowed the railways to spend a great deal more money than would be in the national interest at the moment.

Mr. G. R. Strauss (Vauxhall—Lab.): Can the Minister say to what extent the balancing date of 1962, which was stated in the White Paper setting out the Modernisation Plan, will in fact be postponed as a result of the cuts in capital expenditure which he has imposed?

Mr. Watkinson: I have been advised by the Commission that the present cuts do not invalidate that date.

Level of Advances to the Commission

Mr. Ernest Davies (Enfield E.—Lab.) the Minister of Transport & Civil Aviation on April 2 what was the level of advances to the B.T.C. under the Transport (Railway Finances) Act, 1957 for 1958 and 1959 contemplated by the White Paper Proposals for the Railways, Command Paper 9880; and under what authority he informed the Commission, in his letter of 22nd October, 1957, that the advances for 1959 would be reduced in

accordance with the forecast on which the White Paper was based.

Mr. Watkinson: The 1957 Act authorises the Minister to make advances up to £250 million in total, leaving him free to determine what sums shall be advanced within this limit. The White Paper contemplated that in 1958 the deficit would be rather less than £60 million and would be substantially reduced in 1959.

Mr. Davies: Is this not the first time the House has been informed that the Minister proposed to limit the amounts on an annual basis rather than keep them within the £250 million? Does this not put the Commission in a ridiculous financial position, as part of its deficit will be financed by the Treasury and part must be carried forward in its accounts? Would it not be better to meet the total deficit in the way originally intended under the Act?

Mr. Watkinson: No. The Commission must cut its costs by economies so as to meet the reduction which I have indicated.

Mr. Davies: The Minister is putting the Commission in an impossible position. On the one hand, he says that it must keep its deficit within a certain limit and, on the other hand, he withholds the means for the Commission to reduce the deficit, first, by imposing capital restrictions, and, secondly, by not allowing the Commission to put up its charges to meet wage claims.

Mr. Watkinson: The House must judge

whether £1,500 million devoted to modernisation, spread over a number of years, I agree, and £250 million to finance a deficit, is not as much as the country can at the moment afford to devote out of its scarce capital resources to this most important task.

Rail Link between London and Airport

Sir Alfred Bosom (Maidstone—C.) asked the Minister of Transport & Civil Aviation what would be the cost of a railway link between London and London Airport; how long it would take to construct; and what was the estimated time a passenger would take from the terminal in central London out to the door of the aeroplane in which he would travel, by using such a railway link.

Mr. Harold Watkinson, in a written reply: A very tentative estimate of the capital cost of a railway link between Victoria and London Airport, including connections to buildings within the airport, is between £16½ million and £18 million. I understand that construction would probably take five years. Parliamentary powers would first be required. The estimated journey time from Victoria to the Airport railway station is 22 min. From there to the aircraft door would probably take between 15 and 35 min., depending on the siting of the railway station and passenger buildings and on the arrangements for customs and baggage.

Contracts and Tenders

Broad-gauge electric locomotives for India

The Indian Railway Board has placed an order for 10 broad-gauge electric locomotives for the forthcoming 25-kV. electrification with Mitsubishi Denki Kabushike Kaisha, Tokyo. A feature of the contract is the deferred payment terms which have been negotiated. An initial payment of 20 per cent will be made and the balance will be payable in 10 equal half-yearly instalments. The total value of the order is some Rs. 98 lakhs.

The Railway Board has also placed an order with Nippon Sharyo Seizoo Kaisha Limited, Tokyo, for the supply of spare parts for metre-gauge railcars, which are already in service.

British Railways, North Eastern Region, have placed the following contracts:—

J. Rhodes & Son Ltd., Wakefield: one Rhodes patent fluid-driven shears

Tangyes Limited, Birmingham: one 200-ton bending and straightening machine

R. Blackett & Son Ltd., Darlington: reconstruction of timber store, Shildon Wagon Works

Modern Paviers Limited, Shipley: repairs to roadways, Hull District.

British Railways, Scottish Region, have placed the following contracts:

John Best (Contractors) Limited, Kirkcaldy: new signalbox, Kincardine Clifton & Baird, Limited, Johnstone: provision of rail sawing and drilling machine, Motherwell long rail welding installation

Paterson, Hughes & Co. Ltd., Glasgow: provision of 10-ton overhead electric travelling crane, Motherwell long rail welding installation

Tangyes Limited, Birmingham: provision of carriage and wagon axle journal re-turning and burnishing lathe, Town-

hill new wagon repair depot, Dunfermline

Blythswood Decorators Limited, Glasgow: painting office accommodation, 23, Waterloo Place, Edinburgh

George Martin (Builders) Limited, Broughty Ferry: new booking hall and ticket office, Tay Bridge Station, Dundee.

R. McCartney (Painters), Limited, Glasgow: cleaning and painting, Waverley Station, Edinburgh.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Iran:

50,000 tons of rails
1,700 tons of accessories.

The issuing authority is the Iranian State Railways Administration, Tehran. Tender documents can be obtained from the Administration at a cost of Rials 1,000. Tenderers are required to make a deposit of \$100,000 or its equivalent in sterling, in the form of a bank guarantee valid for three months. The closing date is June 8, 1958. The Board of Trade reference is ESB/8661/58.

From Pakistan:

51 boiler patching plates, steel, 7 ft. x 6 ft. x ½ in. thick to P.R.S. specn. No. 12-29-49.

The issuing authority is the Department of Supply & Development, Government of Pakistan. The tender No. is CT-2/53412/57. Bids should be sent to the Director General of Supply & Development, Frere Road, Karachi. The closing date is April 28, 1958. Local representation is essential. The Board of Trade reference is ESB/8874/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for cement storage, and railway wagons for Uruguay, recorded in our issues of September 20, 1957, and February 7, 1958, has been postponed to June 10, 1958.

Notes and News

Permanent Way Institution: Summer Convention.—The 1958 Summer Convention of the Permanent Way Institution will be held at Weston-super-Mare from June 7 to June 12.

New Address of B.I.C.C. Hull Branch Office.—With effect from April 21, the address of the Hull branch office of British Insulated Callender's Cables Limited will be 49, Mytongate, Hull. The telephone numbers will be 16470 and 16367.

Permali Group Factory Opened at Gloucester.—A dual celebration took place at Gloucester on April 3 to mark the official opening of the new Permali Group factory and commemorate the 21st anniversary of the company. This factory now houses the combined production of Permali Limited, Hordern-Richmond Limited and Jabroc Limited and is the largest plant manufacturing densified wood laminates in Europe. The factory covers an area of 160,000 sq. ft.

Managing Director of Otraco Visits East Africa.—Monsieur E. Voordecker, Managing Director of Otraco (Office d'Exploitation des Transports Coloniaux) (Belgian Congo), recently visited East African Railways & Harbours installations in Kenya and Tanganyika. During his visit he toured the mechanical workshops, the railway training school, and permanent way depots in Nairobi;

Kilindini Harbour, Mombasa; and the harbour at Dar-es-Salaam. The accompanying illustration shows him with Mr. L. J. Godfrey, Signal Engineer, E.A.R. & H., examining the up main points at Kibera Station.

Public Transport Association Conference.—Mr. T. Robert Williams, Chairman of the Public Transport Association, will preside over the Association annual conference which opens at Harrogate on May 13.

Dismantling Cannon Street Station Roof.—It has now been announced that Cannon Street Station, Southern Region, where work on dismantling the roof has begun, remains open on Saturday mornings. In our April 11 issue it was stated that the station would have to be closed throughout weekends until May 19. The station now closes at 4 p.m. on Saturdays during the period and stays shut until 3 a.m. on Mondays. The Monday to Friday closing from 10.45 a.m. to 3.15 p.m. until May 23 is unaffected.

Coventry Machine Tool Works 1957 Results.—The report of the directors of Coventry Machine Tool Works Limited for the last financial year shows a group net profit, after tax, of £29,757 compared with £27,491 for the previous year. The dividend is 17½ per cent which is the same as last year. Current assets are £356,888 (£340,913) including cash £16,247 (£1,446). Liabilities are £132,297 (£130,053) including overdraft which is nil (£3,373).

G.W.R. Special Trainees' 27th Reunion.—The 27th reunion of the Great Western Railway special trainees took place on April 11 at the Great Western Hotel, Paddington. The arrangements this year were in the hands of the trainees selected in 1931-1936. The chair was taken by Mr. L. Dennis, Assistant Continental Superintendent of the Southern Region. The function was very successful and was attended by 33 members of the old training scheme. The toast of "British Railways" was proposed by Mr. C. A. M. Peaty, District Commercial Manager, Eastern Region, Lincoln, and responded to by Mr. J. H. G. Russell, Assistant District

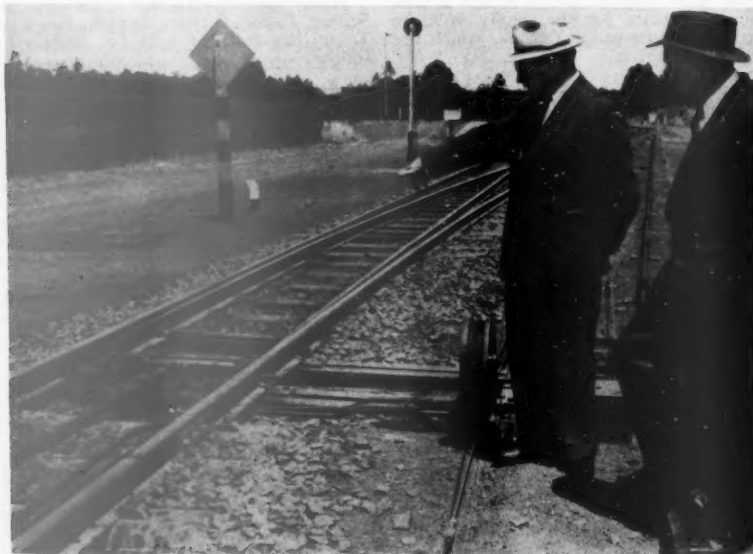
Commercial Manager, Bristol. The toast of "colleagues overseas" was proposed by Mr. E. Havers and responded to by Sir Arthur Kirby, formerly General Manager of the East African Railways & Harbours, and now Commissioner for East Africa in London, and also by Mr. R. F. Stroud, who for 28 years served with the Imperial Tobacco Co. Ltd. in Calcutta and has recently returned to this country.

Chloride Batteries Limited Depot Opened at Leeds.—A battery supply and service depot has been opened by Chloride Batteries Limited at Kirkstall Road, Leeds, as the north-eastern headquarters of Exide Batteries. Besides Exide car batteries and Drydex dry batteries, the new depot deals with batteries for commercial and passenger service vehicles; Exide-Ironclad batteries for electric road vehicles and industrial trucks; and Chloride stationary batteries and Keepalite emergency lighting equipment and miscellaneous battery types for all applications.

Compensation to G.N.R.(I) for Terrorist Damage.—The Great Northern Railway Board at Londonderry quarter sessions recently was awarded £2,350 agreed damages against Londonderry Corporation for terrorist damage caused by a runaway train. It was also awarded £1,300 agreed damages for malicious damage to part of the Londonderry goods shed by fire. The claim was brought under the Northern Ireland criminal injuries legislation. Counsel for the Corporation said that I.R.A. raiders seized a goods train in Irish Republic territory on March 2, 1957, brought it to the border and abandoned it, hoping that it would do the maximum damage at Londonderry station. The driver of the train said it was stopped by masked raiders armed with sten guns. They ordered the train crew out.

Schoolboys' Study Courses in North Eastern Region.—During the period April 14-22, parties of public and grammar schoolboys are taking short study courses in the North Eastern Region of British Railways. During the courses the boys can see something of the many careers now open to them on British Railways. One party, with Darlington as a base, is visiting installations at Darlington, Shildon, York, South Gosforth, Dunston, and Newcastle and studying mechanical, electrical, and carriage and wagon engineering. The second party, based at Whitley Bay, is examining the working of the Chief Traffic Manager's department and visiting stations, marshalling yards, signalboxes, and depots in the Newcastle area. A third party, working from York and Newcastle, is studying the work done by the Chief Civil Engineer's department, with visits to some new works in progress. The fourth party, based at York, is concentrating on the work of the Signal Engineer's department, with a suitable itinerary including signalboxes, new signalling and telecommunication installations, and the automatic telephone exchange at York. Besides practical demonstrations instruction is being given by talks and films. The visits have been arranged in conjunction with the Public Schools Appointments Bureau and the Central Youth Employment Executive of the Ministry of Labour.

Canadian Dispute over Manning Diesels.—Mr. N. Crump, President of the Canadian Pacific Railway, has replied to Mr. H. Gilbert, United States President of the International Brotherhood of Locomotive Firemen & Enginemen, in the dispute over



Monsieur E. Voordecker, Managing Director of Otraco, with Mr. L. J. Godfrey, Signal Engineer, East African Railways & Harbours, at Kibera Station

manning diesel locomotives. Mr. Crump said in an open letter that Canadians were shocked by Mr. Gilbert's attack on the fairness of the Kellock Commission, which had ruled that a second man on diesels in freight yards was dispensable. Mr. Crump suggested that the trade union leader should meet him in Montreal if he thought a discussion would produce results, though he himself would not be prepared to depart from the findings of the Kellock report.

Beyer, Peacock Results.—The total ordinary distribution of Beyer, Peacock & Co. Ltd. was again brought up to 16 per cent as for last year, with a final payment of 6 per cent and a bonus of 6 per cent. This year's distribution, however, is on the capital raised by £171,138 to £1,371,138 as a result of the acquisition of Anti-Attrition Metal Co. Ltd. Combined profits for 1957, before tax, advanced to £579,940 (£512,308) and, after tax, to £265,458 (£235,972). Profits attributable to the holding company were £263,210 (£235,972) and distribution absorbs £126,475 (£110,400).

Rail Journey in Oxygen Tent.—The Western and London Midland Regions of British Railways co-operated recently with the hospital authorities, the Birmingham ambulance service, and an oxygen company to move an 18-months-old child from Cornwall to hospital in Birmingham. The child had spent 16 months in an oxygen tent at the Camborne-Redruth hospital, suffering from heart disease. She travelled in her own cot inside a portable oxygen cabinet in the guard's van of the train. A representative of Oxygenaire Limited was waiting at Bristol, half-way on the journey, to re-charge the oxygen tent. When the train arrived at Birmingham Snow Hill, the cot, with oxygen tent equipment, stood over 6 ft. high and had

to be wheeled into a goods lift to be taken to street level, where a specially adapted furniture van was waiting.

Paterson Hughes Products on Show.—At the Mechanical Handling Exhibition, to be held at Earl's Court, London, on May 7-17, the Paterson Hughes Engineering Co. Ltd. will be exhibiting among other products the Palletizer, which was seen at the last exhibition. This time it will incorporate fully automatic operation. Advice will also be available on all other aspects of Paterson Hughes activities in the handling industry. The company's crane division will be represented at the stand.

No-Passport Day Excursions.—The Home Office and the French Government have agreed that Eagle Steamers may run no-passport day trips again this summer to Calais and Boulogne. Eight no-passport day trips would be run each week from mid-June to mid-September to the French ports, from Gravesend, Southend, Clacton, Margate, Ramsgate, and Deal. This is the first year since the war that there will be a no-passport day trip from Deal. Trips will also be run from Folkestone, Newhaven, and Southampton.

Eagre Construction Company Takes Over Isca Foundry.—The Eagre Construction Co. Ltd., of Scunthorpe, has acquired the whole of the shares of the Isca Foundry Co. Ltd., of Newport, Mon, manufacturers of switches and crossings, buffer stops, turntables, pressed-steel chairs, iron castings, and similar material. Mr. John Spafford is now Chairman & Managing Director of both concerns. Colonel W. L. C. Phillips, one of the recently retired directors of the Isca Foundry Co. Ltd., has been appointed Manager, and Mr. J. Thomas Secretary. Isca will retain its name and trade as before the takeover, except that extra efforts will be made to increase the flow of the companies' products to both home and export markets.

Monorail at Brussels Exhibition.—One of the transport exhibits at the Brussels International Exhibition, which opened yesterday (April 17) is a diorama shown by the General Motors Corporation. This represents a typical area of Belgian countryside across which runs a three-level traffic artery. The two upper levels are three-lane roads, each carrying single-direction traffic. Under the lower level is suspended a two-track monorail line carrying trains suitable for suburban traffic. The roads and monorail tracks are all raised from the ground on pairs of pillars, the height of which varies as necessary to give a level track irrespective of variations in the level of the ground below. The display includes moving traffic, electronically controlled.

Lancashire Dynamo Holdings Limited.—At a recent meeting of the board of Lancashire Dynamo Holdings Limited a final dividend of 7 per cent on the ordinary stock of the company, less tax, was recommended, making a total of 11 per cent, less tax, for the year ended December 31, 1957. The net profit of the group for the year before taxation amounts to £746,565 (£620,387 in 1956) from which must be deducted taxation on these profits of £403,490 (£342,160) and to which must be added taxation provisions no longer required £39,646 (£23,068), leaving a balance available for appropriation of £382,721 (£301,295), less £1,587 retained in subsidiary companies. The annual general meeting will be held on June 3.

Institute of Transport President Visits South Africa.—Sir Reginald Wilson, President of the Institute of Transport, accompanied by the Secretary of the Institute, Mr. F. W. Crews, left London Airport on April 4 to visit the Southern Africa Division of the Institute. Their itinerary, includes Johannesburg, Pretoria, Durban, East London, Port Elizabeth,



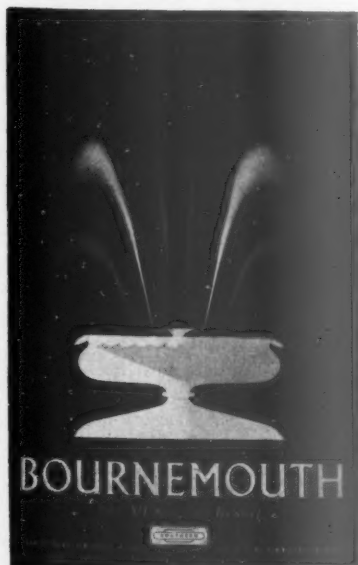
Sir Reginald Wilson and Mr. F. W. Crews leaving London Airport en route to South Africa

Cape Town, Bulawayo, and Salisbury. Inspections are being made of transport installations at each centre, and the President will address meetings of the members. The tour concludes with a visit to the Northern Rhodesia Copperbelt. The return to London will be early in May.

Metrovick Easter Holiday Course for Boys and Girls.—Beginning on April 14, the Metropolitan-Vickers Electrical Co. Ltd. has been holding for one week a vacation course for schoolboys and schoolgirls from public and grammar schools. Some 40 fifth and sixth formers are guests of the company and enabled to gain first-hand engineering experience through a programme of progressive practical training. Half of each day has been spent under instruction in the Apprentice Training School, and the other half in visiting manufacturing departments and design laboratories. Talks are given by senior members of the research, design, sales, and manufacturing departments, who explain the work they do as professional engineers and the opportunities arising in electrical and mechanical engineering. Films help to illustrate these talks. Throughout the course boys and girls can discuss any matters with the managers and members of the staff of the Education Department.

Speeding Bulk Cement Deliveries in the Southern Region.—To speed the unloading of cement from bulk cement wagons to road vehicles at their cement handling depot at Poole, the Southern Region of British Railways is using mobile blower units consisting of a single-stage supercharger driven by an air-cooled diesel

Southern Region Publicity



New winter poster for Bournemouth designed by R. M. Lander; the colours are red, yellow, green, and blue on black background

engine. The supercharger, manufactured by Wade Engineering Limited, Brighton, delivers 200 cu. ft. of free air a min. against a constant back pressure of 10 lb. sq. in. at a rotational speed of 3,300 r.p.m. The engine is a Petter McLaren type PD2 direct injection with two cylinders vertically in line, developing 24 b.h.p. at 1,800 r.p.m. The unit, which is capable of moving a ton of cement a min., was designed and built by Thomson & Taylor (Brooklands) Limited to the specification prepared by Mr. D. F. C. Hill, Road Motor Engineer, Southern Region.

Easter Traffic Reduced by Cold Spell.—The British Transport Commission has stated that an assessment of the effect of the bad weather during the Easter holiday showed that this had caused a drop of about £250,000 in the takings of the Commission's rail and road undertakings, compared with a normal Easter. The number of passengers travelling on the principal long-distance trains from London termini alone during the holiday showed a decrease of nearly 60,000, or more than 9 per cent, compared with the corresponding period in 1957.

School of Welding Technology Day Courses.—Further full-time day courses are being organised by the School of Welding Technology. The first series of courses organised between October, 1957, and March this year were very well supported. The titles of the seven courses are "Welded Structures," "Health and Safety in Welding," "Welding in Shipbuilding," "Inert-Gas Arc Welding," "Control of Distortion," "Residual Stress and Stress Relief," and "Design and Construction of Welded Pressure Vessels and Pipework." Further courses planned for the future include one on welded design and construction of railway rolling stock. Students will be assumed to have received a full engineering training and to have at least a basic knowledge of the various welding processes. Further details can be obtained from the Institute of Welding, 54, Princes Gate, London, S.W.7.

Forthcoming Meetings

April 19 (Sat.).—Permanent Way Institution, Manchester & Liverpool Section, at the Manchester College of Science & Technology, Sackville Street, Manchester, at 2.30 p.m. Paper on "Factors in the running of a high speed train service," by Mr. O. S. Nock.

April 19 (Sat.).—Permanent Way Institution, East Anglia Section, at Cambridge, at 2.15 p.m. Paper on "Long-welded rails," by Mr. J. Game.

April 22 (Tue.).—Institute of Transport, Metropolitan Graduate & Student Society, at 80, Portland Place, London, W.1, at 5.45 for 6.15 p.m. "Transport Forum."

April 25 (Fri.).—Institution of Railway Signal Engineers, Bristol Section, in the meeting room, Temple Meads Station, at 6 p.m. Paper on "Cables and lines," by Mr. W. H. Dyer.

April 26 (Sat.).—Railway Correspondence & Travel Society, at "The Windsor Castle," Vauxhall Bridge Road, London, S.W.1, at 7 for 7.30 p.m. 30th Anniversary Dinner.

April 26 (Sat.).—Permanent Way Institution, Leeds & Bradford Section. Visit to York signalbox.

April 29 (Tue.).—Institute of Transport, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Informal luncheon.

May 1 (Thu.).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 5.30 p.m. Film evening.

May 1 (Thu.).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Modelling the Furness Railway (Part 2)," by Mr. R. D. Pochin.

May 2 (Fri.).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Paper on "London to Inverness by day," by Mr. H. A. Vallance.

Railway Stock Market

The Budget has naturally been the dominating influence on stock markets this week, and before the Chancellor's statement an upward trend was in evidence under the lead of British Funds, which continued to reflect expectations of a further reduction in the bank rate in the near future. The improvement in industrial shares was partly technical, due to shortage of shares in the market, but demand was better, buyers being attracted by good yields and the assumption that dividends generally are likely to be maintained at last year's levels.

Only limited business was reported in foreign and other railway stocks, and price movements have been small and without any particular trend. Canadian Pacific reflected Wall Street, and as compared with a week ago, have receded from 346½ to 345½; the preference stock remained at 53½, but the 4 per cent debentures improved on balance from 66½ to 67½. White Pass declined from \$144 to \$134.

Elsewhere, Peru Transport shares were again lower at 5½ on the latest developments, though the latter certainly improve the long term outlook. Mexican Central "A" bearer debentures remained at 68.

United of Havana second income debentures kept at 5½ and the consolidated stock was dealt in around 1½. In other directions, San Paulo Railway units again changed hands around 2s.

Chilean Northern 5 per cent debentures were quoted at 35 and Costa Rica ordinary stock at 17. International of Central America common shares eased from \$21½ to \$20½.

Antofagasta ordinary stock has strengthened from 15½ to 16 and the preference stock from 34½ to 34½, while the 5 per cent (Bolivia) debentures kept at 94½.

The improved business recently in evidence in shares of locomotive builders and engineers was not fully maintained, and North British Locomotive eased from 14s. to 13s. 9d., though on the other hand, the yield of over 10 per cent brought in buyers for Beyer Peacock 5s. units, which at 7s. 7½d. compared with 7s. 4½d. a week ago. Birmingham Wagon remained at 17s. 6d., while Gloucester Wagon 10s. shares at 13s. 3d. and Wagon Repairs 5s. shares at 11s. 6d. were virtually the same as a week ago. On the other hand, Charles Roberts 5s. shares eased further from 8s. 3d. to 8s. G. D. Peters were once again maintained at 30s.

Westinghouse Brake showed further

improvement from 36s. 6d. to 37s. Stewarts & Lloyds, with a rise from 21s. 6d. a week ago to 22s. 4½d., reflected the better trend in steel shares, Craven Brothers 5s. shares were 6s. 10½d. and Guest Keen rose further to 50s. 3d. In other directions, F. Perkins 10s. shares were 10s. 4½d., but Ruston & Hornsby had a less firm appearance at 25s. 6d. T. W. Ward remained firm at 75s. 3d. and elsewhere, Vickers moved up to 31s. 3d. while Blaw Knox 5s. shares changed hands around 19s. 6d. and Blackwood Hodge 5s. shares were 12s. 10½d. Power Gas Corporation 10s. held steady at 28s. 9d.

Pressed Steel 5s. shares lost part of their recent rise, easing from 15s. 4½d. to 15s., but Dowty Group 10s. shares strengthened afresh from 34s. 3d. to 34s. 6d. British Timken gained 1s. at 48s. Associated Electrical have risen from 48s. 9d. to 49s. 6d. after Lord Chandos' speech at the annual meeting, which emphasised the progressive policy of the group and foreshadowed a large debenture issue later in the year. Moreover, as compared with a week ago, General Electric have moved up from 30s. 6d. to 31s. 9d. and English Electric from 52s. 3d. to 54s. 9d.

OFFICIAL NOTICES

YOUNG ENGINEER, preferably Loco. or Carriage Shop trained, age 24-28, required by well-known manufacturers of specialities for Railway Rolling Stock as assistant to Contracts Manager. Pensionable position offering good prospects. Apply Box 585, *Railway Gazette*, 33 Tothill Street, London, S.W.1.

CHIEF DRAUGHTSMAN required for old-established Midland firm of Permanent Way Engineers. Only men (aged 30-50 years) skilled in knowledge permanent way design and production should apply. State age, experience, salary required to Box 576, *Railway Gazette*, 33 Tothill Street, London, S.W.1. Willing to assist housing finance.

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SENIOR ASSISTANT TRAFFIC SUPER-INTENDENTS required by Malayan Railway Administration, Federation of Malaya, for 1 tour of 3 years. Salary scale (including Expatriation Pay and present temporary allowances) equivalent to £1,218 rising to £2,119 a year (single men), £1,440 rising to £2,499 a year (married men), £1,531 rising to £2,730 a year (family men). Commencing salary according to qualifications and experience. Gratuity at rate £232/£324 a year. Free passages. Liberal leave on full salary. Candidates must be Corporate Members of the Institute of Transport and have had considerable experience in the Operating and Commercial Departments of a railway. Write to the Crown Agents, 4 Milbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M/344151/R.A.

THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of: 26,156 AXLEBOX GUARD GROOVE LINERS, Manganese Steel. Forms of tender may be obtained from the above address on or after the 18th April, 1958, at a fee of 10s. which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Thursday, 29th May, 1958. Please quote reference No. 135/57/RLY.

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